Encountering the City: Waymaking and the Mobile Practices of Cycling

Roger Vreugdenhil

(BEng MEnvMgt)

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Declaration

This thesis contains no material which has been accepted for a degree or diploma by the University or any other institution, except by way of background information and duly acknowledged in the thesis, and to the best of my knowledge and belief no material previously published or written by another person except where due acknowledgement is made in the text of the thesis, nor does the thesis contain any material that infringes copyright.

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Roger Vreugdenhil

Date: 14th November 2016

Abstract

Every day, tens of thousands of Australians don helmets and set out on bicycles to commute to work or school. On average, though, just one in every one hundred Australians chooses to commute by bicycle rather than drive, walk or catch public transport. Cycling is a healthy, inexpensive and sustainable means of urban travel, and significant societal, environmental and personal benefits can result from even a modest increase in the rates of people regularly cycling in cities. In order to boost participation levels in Australia, a national cycling strategy was implemented in 2011 with the aim of doubling the number of people cycling by 2016. The strategy adopted the dominant instrumental approach to transport planning in modern societies: *build it and they will come.* However, while the extent and quality of cycling infrastructure has improved in Australian cities over the past five years, there has been no significant change in cycling numbers. The reasons remain unclear but invite further and perhaps more novel approaches to understanding this particular mode of transport.

This thesis moves outside the dominant scripts of instrumental transport studies, taking inspiration from the attention to mobile practices found in the emerging fields of mobilities studies and non-representational theory. The research focuses on the *doing* of cycling. More-than-instrumental knowledge of how cycling practices are produced in the daily throng of cities was sought by foregrounding the embodied and relational experiences of being in the bicycle saddle. The regular commuting trips of eighteen cyclists in two Tasmanian cities were recorded using a bicycle or helmet-mounted video camera. Participants were then interviewed using the video footage as stimulus material. Video and interview data were analysed thematically using NVivo software. The analysis included the mapping of haptic or 'felt' surface geographies when the excessive shaking and rattling of several of the video recordings was investigated rather than dismissed as nuisance 'white' noise. The co-agential entity of the 'bike-rider' was employed to explore how temporal, spatial and bodily phenomena gather together in cycling practices.

Central to the findings is the concept of waymaking, or the ways in which journeys are brought into being. Waymaking was synthesised from themes interpreting the timing-spacing-acting practices of cycling. In their mobile practices of waymaking participants became 'fused' with their bicycles, a form of more-than-human agency focused on maintaining balance amidst the instability and turbulence of city cycling. Participants brought

heightened sensory and situational awareness to the immediacy and intensity of unfolding events by 'being in the moment'. They also exhibited a high degree of relational interaction, particularly in collaborating with drivers to manage on-road encounters. Participants smoothed the space and time of their journeys by pursuing the flow of desirable trajectories or 'lines of desire'. The importance of riding surfaces to cycling was also highlighted through the frictional affects and effects of surface rhythms. Through the lens of waymaking, cycling is understood to be a highly affective, sensual and generative encounter with the city, a process in which cyclists balance and smooth the frictions, intensities and events of their rides.

This thesis advances understandings of the mobile practices through which cycling is enabled, constrained and accomplished in cities. Cyclists generate urban worlds through the mobilities of flow, friction and turbulence. Foregrounding embodied and relational practices to enable more-than-instrumental accounts of everyday cycling opens up new possibilities for knowing and doing cycling.

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Chapter 1 Cycling-as-transport

Cycling as everyday transport

Every morning, tens of thousands of Australians put on their helmets and mount their bicycles before setting off on their routine commutes to work.[1] In many ways daily journeys by bike are organised around the same necessities of day-to-day living as those by motor car and public transport.[2, 3] Travelling by road to all manner of everyday destinations is a familiar routine of urban life. However, the travel practices of cyclists within the highly motorised transport systems of Australian cities are anything but ordinary. From a number of perspectives, the very presence of bike riders in the daily circulations of people in Australian cities suggests a 'mobile other', a mobile presence out of step with mainstream modes of travel. There is a notable absence of bicycles in the hustle and bustle of Australian road traffic. The proportion of people traveling to work by bike in Australian cities hovers at just over 1% compared to people traveling by motor car at just under 80% (Australian Bureau of Statistics 2009).

Bicycles are classified as vehicles under the Australian road rules yet there are pronounced differences in size, weight, power and technological complexity between bicycles and motorised vehicles such as cars, buses, and trucks. The utilitarian, thin, almost skeletal form of a bicycle is lightweight and thus readily propelled by pedalling. Indeed, bikes are exceedingly efficient at converting muscle power into mechanical movement (Wilson 2004). Nonetheless, for all their size and weight, cars can propel their drivers along at much higher speeds and accelerations. The close proximity of bikes and cars in city streets magnifies these differences. Cars, for example, can quickly overtake cyclists, giving the latter little time to register their presence. Studies in Canberra (Johnson et al. 2014) and Melbourne (Johnson et al. 2010) show that speed differentials are a factor in almost two-thirds of near miss collisions between bikes and cars. The larger and faster moving flow of motorised traffic also acts to

[1] 'Bicycle' and 'bike' are treated as equivalent terms in the thesis, as are 'cycling' and 'bike riding'. In Australia, it is mandatory for bike riders to wear helmets.

[2] This study is about cycling as a means of 'transport' rather than for leisure or fitness *per se*.

[3] 'Public transport' refers to road-based public transport.

traffic squeeze bike riders out of the way, thus shifting the usual place of cycling to the margins of roads (Steele and McTiernan 2010).

There are important differences in the way that people travel *in* cars rather than *on* bikes. Drivers and passengers are enveloped in car bodies designed to mitigate the effects of wind and weather, and to cushion fragile human bodies in the event of a crash. Safety features such as air bags and seat belts (mandatory wearing in Australia) add a sense of reassurance to car travel. Drivers and passengers are also comfortably-seated and 'surrounded by micro-electronic information sources, controls and sources of pleasure' (Urry 2006, 23). With the car body and wheel suspension effectively screening out many of the sensations of moving, car interiors enable a distinct, if today normalised, experience of travel (Laurier et al. 2008). In contrast, a cyclist travelling on a bicycle is more exposed to the open-air. For example, cyclists are exposed to the vagaries of the weather. They can be assisted by following winds or slowed by headwinds; they can be caught in downpours or warmed by sunshine.

People traveling by bike in the open-air are also more vulnerable to being injured in a crash compared to people traveling by car. Cyclists rely on just a few accessories and features to mitigate the effects of a crash, including, in Australia, the mandatory protective helmet. In addition, a two-wheeled bike is inherently less stable than a four-wheeled car. Cyclists gather stability with speed but stability is an ongoing and active achievement of a balancing and moving bike and rider. And while each of the foregoing perspectives portrays travelling by bike as different, indeed out of step with the mainstream car travel, there are compelling reasons for encouraging more people to ride bikes, more often.

Cycling is a physically active form of travel: an interactive meshing of human movements and mechanical componentry. Over time, regular cycling strengthens muscles, improves cardio-vascular function and burns fat, thus significantly reducing the risks of chronic (and largely preventable) health problems such as diabetes, obesity and heart disease (Bassett et al. 2008; Garrard et al. 2012; Oja et al. 2011; Wen and Rissel 2008). If more people cycled more often, in time, the collective improvement in health outcomes would lead to substantial savings in public health costs (Australian Institute of Health and Welfare 2014; Rissel et al. 2013). The health cost of physical inactivity to the Australian economy was estimated in 2012 at $13.8 billion per year, and rising (Suh 2015).

There are considerable environmental and sustainability benefits from a mode of transport which is powered by human energy rather than energy derived from non-renewable resources. Greenhouse gases (except in miniscule amounts) and other atmospheric pollutants are not emitted (Chertok et al. 2004; Kingham and Tranter 2015). If just 5% of car trips were made by bicycle, Australia's carbon emissions could be reduced by 8% (Victoria Transport Policy Institute 2015). There are sustainability and economic benefits, too, in the simplicity of bicycle construction and operation. The costs of operating and maintaining a bicycle are estimated at around 5% of the equivalent costs for a motor car (Tranter 2004).

Encouraging Australians out of their cars and onto their bikes provides simple, practical, and economical solutions to relieving urban transport corridors prone to traffic congestion. The annual avoidable cost of traffic congestion in Australian cities is reported to rise to over $20 billion by 2020 (Bureau of Infrastructure, Transport and Regional Economics 2007), and the majority of Australian cites have little available space for road expansions (Austroads 2010). Studies show that for distances of up to five kilometres on congested roads it is quicker to travel by bike when the travel time includes the time in getting from door to door (Martens 2007). This is significant, as approximately 20% of trips in Australia cover less than five kilometres (Australian Bureau of Statistics 2009).

Lately, this diverse set of health, economic, environmental and sustainability factors have become a persuasive rationale for encouraging more people onto their bicycles, and more often. Cycling, though, has not always been a marginal mode of travel in Australia. An historical perspective shows a different picture of the place of cycling in Australian life.

Glancing back

The overall proportion of Australian commuters currently choosing to go by bike on any working day is 1.2% on average – small compared to the 78% choosing to travel by car and, to a lesser extent, the 16% choosing public transport (Australian Bureau of Statistics 2009). This was not always the case. From the 1890s, cycling grew rapidly in popularity across Australia with the introduction of the pneumatic tyred 'safety bicycle'. Prior to 1885, bicycles had undergone a series of rapid design evolutions in Europe and the United Kingdom before the development of the safety bicycle. The user-friendly safety bicycle quickly superseded the more dangerous 'penny farthing', thus 'stabilising' the design of the bicycle in essentially

its current form (Bijker 1995). Such was the popularity of this relatively affordable, easily maintained, robust and reliable form of transport in Australia that by about 1900 there was an extensive and well-used network of bicycle paths linking towns and communities in parts of rural Australia. Cycling rates dropped away before and after the First World War due to increases in car usage along with the more widespread availability of public transport. There was, however, a resurgence of cycling in Australian cities throughout the Great Depression and the Second World War as a result of the costs of travel, and of petrol rationing, during the war (Fitzpatrick 2015).

In the post-war years, cycling numbers began declining with the outward spread of Australian suburbs, fanned by a rapid rise in motor car ownership. In the context of the resulting car-dependent urban form (Newman and Kenworthy 1999), the bicycle became 'a less viable, safe, attractive and socially acceptable form of transport' (Fitzpatrick 2015, 37). Detailed, nationwide surveys of the rates of cycling participation only began in the 1980s. Figures show that cycling for fitness or leisure has increased in popularity since the 1980s to rates almost three times those of commuter cycling. Just why the popularity of recreational cycling has not translated into commuter cycling is not well understood. Meanwhile, the overall rates of commuter cycling between 1986 and 2009 have remained largely static (Australian Bureau of Statistics 2009; Fitzpatrick 2015).

Cycling-as-transport: creating the instrumental cycling subject

Cycling remains a minor form of transport in Australian cities, but the potential savings to government spending on public health, environmental issues, and road infrastructure have caught the attention, and even the imagination, of policy makers, politicians, planners and engineers keen on realising the benefits of more active and sustainable communities throughout Australia. Aligned with a growing awareness of the benefits of encouraging greater participation is a discourse in which cycling is increasingly portrayed as a reasonable and appropriate choice of transport. This discourse is instrumental in the sense that the practice of cycling is understood as a means to an end – *a utilitarian means of movement reduced to its technical components and its rational decision making*. The discourse creates an instrumental cycling subject and one that is configured around transport subjectivities. In this discourse, the benefits of cycling are tied to the transport labels of *environmentally-friendly transport*, *sustainable transport*, and, more recently, *active transport* (Australian

Bicycle Council 2012; Austroads 2010; Bell et al. 2006).[4] Through the lens of transport, bicycle travel is seen as a means to an end; an environmentally-friendly, sustainable and healthy means of getting from one place to another. The discourse creates a cycling subject that is the sum of its instrumentally-based aspects and elements, and this is referred to here as *cycling-as-transport*.

Configured by instrumental thinking this cycling-as-transport subject is a measureable and, by implication, manageable cycling entity. In 2010, the *cycling-as-transport* discourse was crystallised in a strategy to encourage more Australians to cycle. A national approach, 'Gearing up for active and sustainable communities: The National Cycling Strategy 2011–2016', was endorsed and launched in 2010 at a meeting of the state, territory and federal transport ministers (Austroads 2010). According to the strategy the benefits of more people cycling were persuasive:

> More people on bikes means a more active, healthier population. It means fitter citizens who can live in cleaner, less congested cities. And it means more people who can travel or enjoy themselves while leaving only a fraction of the carbon footprint of other modes of transport (Austroads 2010, 4).

The strategy focussed on encouraging and planning for 'active and sustainable communities ... to extend the benefits of cycling to all' (Austroads 2010, 4). The way forward was made clear in the strategy:

> While there have been a range of initiatives, cycling has not been supported by a high level of investment. To help counter this, *Gearing up for active and sustainable communities* aims to develop a robust and consistent approach to data to demonstrate the impact of cycling initiatives on a range of outcomes. This will provide essential tools to help states, territories and local governments make the case for increased investment, a crucial step in realising this strategy's goal (Austroads 2010, 5, emphasis in original).

[4] The Australian Bicycle Council is made up of federal agencies responsible for health, the environment and infrastructure development, all state and territory transport agencies, Austroads, and the Australian Local Government Association. Austroads is the peak organisation of Australian and New Zealand road transport and traffic agencies.

The strategy included a wide-ranging mix of policy and planning objectives and activities configured around cycling-as-transport. These included state and local campaigns promoting cycling as a 'viable and safe mode of transport'. There were nation-wide measures introduced to encourage a more integrated approach to planning to 'consider and address cycling needs in all relevant transport and land use planning activities' (Austroads 2010, 5).

The overarching vision for the National Cycling Strategy was to enable 'a step-change in attitudes to cycling and in the numbers of riders in this country' (Austroads 2010, 5) which was realised through the principal (and measureable) goal:

> In the short term, *the goal is to double the number of people cycling over the next five years*. This is an ambitious goal, and rightly so given the numerous benefits that cycling can bring (Austroads 2010, 5, emphasis added).

The goal of doubling the cycling participation rate across Australian over the five years to 2016 hinged on creating 'a comprehensive network of safe and attractive routes' by increasing capital investment in the amount and quality of bicycle infrastructure such on road bicycle lanes and off road bicycle paths (Austroads 2010, 5).

Funding for bicycle infrastructure was increased. Metropolitan councils more than doubled infrastructure investment from $21.9 million in 2007 to $46.6 million in 2011 (Australian Bicycle Council 2012). State and territory governments increased investment from $82.8 million in 2010-2011 to $123.6 million in 2014-2015 (Australian Bicycle Council 2015). [5] Increasing investment in cycling infrastructure was justified by the rationale that more, and better quality, cycling infrastructure encourages more cycling. This is a dominant instrumental approach to bicycle transport planning, and is neatly summed up in the adage: *build it and they will come* (Buehler and Pucher 2012; Cervero et al. 2013; Geller 2011; Pucher et al. 2010). However, this instrumental understanding of cycling bound up in the *build it and they will come* approach is not working in Australia – over the past five years, the infrastructure has been built but the cyclists are *not* coming.

[5] The investment figures are compiled from the graph 'State and Territory Cycling Investment 2010-2015' (Australian Bicycle Council 2015, 10).

As part of the National Cycling Strategy, a regular, comprehensive, nation-wide cycling participation survey was instituted to monitor the anticipated increases. Rather than fulfilling the key objective of doubling participation levels, however, the results of three surveys published in the *National Participation Survey 2015: National Results* (Austroads 2015a) report a slight overall *drop* in cycling for transport in Australia in the five years to 2015. Some cities show slight increases in participation and others slight falls. In Hobart, for example, the survey results show that 'participation has decreased' (Austroads 2015b, 2). While almost three times as many people were likely to have ridden for recreation as for transport, again the nationwide trend was essentially unchanged across the three surveys (2011, 2013, and 2015). The authors of the survey acknowledge that:

> The NCS [National Cycling Strategy] target of doubling the number of people cycling between 2011 and 2016 is unlikely to be achieved. This is true irrespective of whether the target is defined as those cycling over a typical week, month or year. Instead, it appears cycling participation has at best remained stable and at worst declined marginally since 2011 (Austroads 2015a, 10).

Far from doubling the amount of cycling, the declining or, at best, unchanged state of cycling participation in Australia is an unexpected outcome of the National Cycling Strategy's nationwide push to improve participation through the funding of program and infrastructure interventions. The strategy has failed to shift cycling from the margins of everyday travel to a more mainstream choice. This is despite the comprehensive funding of infrastructure and programs through the coordinated efforts of planners and engineers, and supported by politicians and policy makers throughout Australia (Australian Bicycle Council 2012). Moreover, this outcome has not been addressed in the two documents reporting progress towards the goals of the strategy (Australian Bicycle Council 2015; Austroads 2015a). Accordingly, the reason for the failure of the strategy's key goal of doubling the number of people cycling remains unclear.

There have also been widespread negative reactions to new cycling infrastructure in Australian cities over the last decade (Vreugdenhil and Williams 2013). Indeed, from a New Zealand perspective similar concerns have been raised as to what is it that continues to eludes government-backed initiatives promoting cycling whereby; 'despite their efforts and their constant representation of commuter cycling as a kind of no-brainer, their campaigns fail to

resonate with most people' (Cupples 2011, 228). There is no doubt that the transport-based knowledge of transport policymakers, engineers, planners and consultants is important in realizing cycling as a more mainstream mode of travel. There appear to be major shortcomings, however, in the failure of instrumental approaches such as the National Cycling Strategy. What is missing from the instrumental approach of cycling-as-transport?

In 2008, it was noted that the transport choice of cycling in Australia, along with the United Kingdom, the United States of America and Canada, was 'quite resistible' (Pucher and Buehler 2008, 495). Eight years on, and with the initiative of the National Cycling Strategy to encourage and support cycling through comprehensive infrastructure investments, the majority continue to resist the choice to ride a bike to work. Cycling is embedded in complex urban contexts and practices – it is not reducible to instrumental and only instrumental knowledge. While these contexts and practices needs to be known, transport professionals typically treat cycling as a logistical exercise (efficient movement from A to B), rather than recognising its socio-cultural, political, psychological and material dimensions. To avoid the shortcomings of, for example, the National Cycling Strategy, new knowledge is required rather than simply re-running scripts already in the grip of cycling-as-transport mentalities. The opportunity for developing comprehensive and, ultimately, more productive understandings of cycling lies in alternative and more novel approaches to studying this particular mode of urban mobility beyond cycling-as-transport.

Beyond cycling-as-transport

There are many ways of knowing cycling, and the instrumental cycling-as-transport perspectives of the National Cycling Strategy are but one. People also know cycling through various social, environmental, political, practical and personal dimensions (Horton et al. 2007). In trying to make sense of the full-bodied experience of cycling, this study focuses on how meaning is made in the doing of cycling. While this focus does not discount instrumental accounts of technology, technique and action, it ranges wider to include accounts of sensation, emotion, relation and creation. To develop this more-than-instrumental approach to researching cycling, this study is shaped by the perspectives and approaches of two emerging currents of social theory: mobilities thinking, and non-representational theory. While these theoretical resources are more fully described in Chapter 2, Tim Cresswell's mesotheory of mobility (Cresswell 2006; 2010) is a useful framework at the outset for this thesis. Cresswell's particular approach, followed by non-representational theory, is introduced below.

Mobility, for Cresswell, encompasses three interrelated dimensions: movement, representation, and practice. Movement is the fact(s) of physical movement in getting from A to B which for this research is equated with transport thinking and approaches. Representation is the shared cultural and social meaning associated with going from A to B. Practice is the embodied and experiential accounts of going from A to B. For urban travel systems, the instrumental facts of movement are realised in transport thinking and approaches. But urban mobility is more than just transport, and the needs to be rethought beyond the traditions of transport, as mobility scholars such as Cresswell argue.

Understanding mobility relies on accounts of affective, emotional and corporeal elements of practices as much as on transport accounts (and those of social meaning) (Cresswell 2010). In Creswell's approach, 'mobility' is the overarching and unifying concept across the three dimensions, and practice, the more-than-instrumental 'actuality' of travel, is the least researched of the three. As Cresswell writes: 'Real bodies have never been at the top of the agenda in transport studies' (2010, 19). Importantly, each dimension is implicated in the others, and is best understood in the light of the others. Transport (or movement), representation and practice stand as equally important sources of knowledge production, each informs the others but none is necessarily privileged.

Thinking ‘non-representationally’ is important in dealing with the challenges of researching and representing the embodied practices of travel. Non-representational theory is based in ‘the leitmotif of movement in its many forms’ (Thrift 2008, 5), affirming the world as a lively place overflowing with encounters, events, precognitive affects and embodied understandings. This world is continually assembled though socio-material encounters and interactions. While the approach of non-representational theory acknowledges the usual forms of representation, such as written texts, non-representational theory also acknowledges that the world is experienced and understood in ways which are difficult to research and represent.

The instrumental accounts of cycling-as-transport are important. Ultimately, however, this study is about generating accounts of everyday cycling by attending to new possibilities for knowing and doing urban cycling. Focussing on everyday cycling and, more specifically, on the practices of the mobile bike and rider, allows those practices to ‘speak’. Observing the doing of cycling becomes a narration of practice. Practices, though, are never in isolation. In their everyday travel practices, people encounter the city in different ways. Cities are complex: ‘They gather, mix, separate, conceal, display. They support unimaginably diverse social practices. They juxtapose nature, people, things, and the built environment in any number of ways’ (Amin and Thrift 2002, 3). Daily travel, then, is understood to be more than just a utilitarian encounter with the city.

Part of the impetus for this study is that I use a bike as my means of regular ‘transport’. It began ten years ago when I began commuting by bike to and from work. At the time I rationalised it as a way of maintaining a reasonable level of fitness plus freeing up one of our two cars for other family members. I soon found I was routinely reaching for my helmet instead of the car keys when needing to get to places besides work. Traveling by bike did keep me fit and did free up the car, but it became more than that. I became actively involved with a grassroots advocacy group as their representative on the Launceston City Council’s bike committee. But while I was readily able to point out the risks of negotiating this road or that type of infrastructure, there was much that was difficult to articulate. For example, how did the diverse set of skills and experience of the regular riders I knew translate into effective practices in negotiating roads, traffic and infrastructure. Riding on a bike *is* quite different from driving in a car. There seemed to be much to be gleaned from how they successfully went about *their*

everyday rides that went missing in council transport strategies and monthly committee meetings.

Another motivation for this study lies in my prior research into the contested implementation of an urban bike lane network in Launceston, Tasmania (Vreugdenhil 2011; Vreugdenhil and Williams 2013). Characterised as *white line fever*, the installation of white line markings to demarcate bicycle lanes triggered heated disputes. But what happens when such disputes between cyclists and drivers subside? How might the material presence of these bike lanes shape cycling, and perhaps driving, practices over time? And what happens in the vast majority of city streets in Australia without any cycling infrastructure at all? The answers lie in moving beyond the binaries of disputes and differences. For this study, the answers lie in centring and researching the qualities of cycling practice to generate new knowledge of how bike riders go about their everyday mobile practices. This study's focus is on the more-than-instrumental, more-than-transport accounts of cycling.

Research questions

Two research questions guide this inquiry. First:

> How is the mobile practice of cycling a more-than-instrumental encounter with the city?

The intention is to understand how cycling practices are produced in the everydayness of urban travel. That is, how is cycling 'done'? The question is designed to open the research up to the possibilities of generating new knowledge and understanding of cycling beyond instrumental framings of cycling-as-transport. The first research question brought a second in its train:

> How can mobile subjects be researched?

The methodological challenge of researching a moving bike rider in the midst of city streets and traffic is addressed in Chapter 3: Researching mobile subjects.

Following the theoretical framing of cycling as the interrelated elements of transport, representation and practice, generating new knowledge in this under-researched area is anticipated to be valuable in and of itself, with the added possibilities of enhancing 'transport studies'. While this study, and the framing of its questions, is set against the context of the

National Cycling Strategy, this investigation is not about the failures of the strategy, nor does it set out to probe why more people did not take up cycling in response to the strategy. That being said, the strategy does demonstrate the limitations of current approaches and the timeliness of this type of study. Likewise this study is not about investigating why people do not cycle. What it very much focussed on is the people who do, and importantly *how* they do it. Knowing how people go about their regular practices has the potential to unsettle and invigorate more mainstream knowledge that may, in turn, encourage improvements in planning and policies for bicycles.

The thesis uses a number of terms interchangeably. Both *bike rider* and *cyclist* are used to describe a person in the act of *cycling* or *bike riding*. Bike riding (or cycling) is not always preoccupied with pedalling and moving, though. There are beginnings to a ride and, importantly, endings, where the bike is stowed, parked or stored. There are also moments of stillness, for example when stopped at traffic lights. In the choice between *bicycle* and *bike*, bike is generally used. Importantly, *cycling* and *bike riding* are referring to cycling or bike riding for travel as an alternative to using a car. This might be cycling to work or school, to the shops, or to visit friends as part of people's everyday 'transport' arrangements and is not cycling for leisure or for fitness *per se*.

For this research, instrumentality is equated with the dominant, transport-based approaches to daily urban travel. 'Transport' refers to the taking or conveying of people or goods from one place to another (Oxford Dictionaries 2016). Within instrumental epistemologies, the purpose of travel is the efficient movement of people and goods from A to B. Transport has been described as the 'displacement or carrying across of an already constituted, self-contained entity from one location to another' (Ingold 2011, 162), whereby movement takes place but the entity is left *unmoved*. What happens between A and B is accorded lesser importance than the motive for departure and the achievement of arrival. The experience of movement is subsumed into a neutral black box, with the importance of transport residing in the utility of movement.

Thesis structure

Chapter 2: From instrumental to more-than-instrumental accounts of cycling is in three sections. The first reviews the ways in which daily urban mobilities are currently framed in instrumental, transport-centric approaches in the empirical research literature. The second section explores the theories and approaches of mobilities and non-representational thinking. Félix Ravaisson's portrayal of habit is also explored (2008 [1838]). Ravaisson's work has become the source of a revitalised interest in habit. The third section reviews the emerging forms of more-than-instrumental research. These emerging accounts are influenced by the non-transport dimensions of mobilities approaches.

Chapter 3: Researching mobile subjects draws on the theoretical and empirical resources outlined in Chapter 2 to develop a research methodology to generate more-than-instrumental accounts of cycling mobilities in Australian urban contexts. Within mobilities research it is argued that mobile subjects require 'mobile methodologies'. While mobilities research should not be conflated with mobile methodologies, the reasons for choosing the methodology of mobile video ethnography for this study are set out.

Mobile video ethnography produces two sources of data: video footage, and participant interviews using the video footage as stimulus material. The method of thematic data analysis, and the use of the computer-based data management processes of NVivo, is discussed. A 'unit of analysis', the co-agential entity of the bike rider, was also created to use as a lens for studying cycling practices. The difficulties of combining and presenting images drawn from videos with the corresponding interview text are overcome by a 'storyboarding' of findings. Storyboarding uses video stills combined with speech bubbles as a way of illuminating key aspects of cycling practices.

The two Tasmanian cities chosen for the fieldwork, Launceston and Hobart, are introduced, along with a summary of the eighteen participants, their bikes and the rides featured in the research. Finally, and before moving to the four analytically-informed findings chapters, a summary table of the nine themes developed in the first three of these findings chapters is tabulated. Each theme is set out in turn (three per chapter), developed using the empirical findings of this research, and informed by the wider scholarly literature.

Chapter 4: Moving moments is the first of the analytically-informed findings chapters. The three themes show how practices unfold in the many moving moments of a journey. The first theme portrays how cyclists deal with the moment to moment demands of cycling in busy places by heightening their awareness. The stability of the bike and rider is examined in the second theme. A moving bike rider is shown to be a balanced and even fused entity, but one which must be considered as a provisional, metastable achievement. Finally, the timing (and spacing) of the bike rider's riding lines add to the emerging understandings of cycling practices developed in the final theme.

Chapter 5: Moving places shows how cycling practices are developed in the materiality and heterogeneity of roads and traffic. Beginning with the more fixed places and spaces of roads, streetscapes and infrastructure, the bike rider is followed though roundabouts and intersections, as well as along smooth and sometimes potholed road surfaces. Next, encounters with moving cars and pedestrians show how space is created on roads, shared on footpaths, and finally appropriated at the end of a trip for bike parking. In the last theme, the smoothness and roughness of road surfaces is revisited but in greater detail. This theme emerged unexpectedly from problems with nuisance 'white' research noise – the shaking and rattling of my bike-mounted video camera.

Chapter 6: Journeying shows how the timing, spacing, and acting practices of cycling cohere across a journey. The first theme demonstrates that there are beginnings and endings, reasons and reasoning for cycling trips. Next, the findings about on-road collaborations between bike riders and car drivers are explored. These are critical encounters for enabling safe cycling and are produced through fine-grained negotiations and collaborations. This is demonstrated using three examples of higher- and lower-speed collaborations. The final theme, *making journeys: waymaking*, gathers together the foregoing thematic ideas into the concept of waymaking.

Chapter 7: Surface Affects and Lines of Desire. This chapter uses two key examples, or exemplars, to develop the idea of waymaking. Waymaking is shown as a contingent process, never quite stable, always in the making (and the unmaking) but cohering as the journey; this is demonstrated through the exemplars of Surface Affects and Lines of Desire. Surface Affects highlights the (usually) subtle affects and effects created in the interplay between bikes and road surfaces. Lines of Desire shows how bike riders smooth their timings and

spacings of journeying by pursuing their desired riding lines: their lines of desire. Waymaking shows city cycling as a highly affective, sensual and generative encounter whereby cycling is accomplished by practices of balancing and of smoothing the frictions, intensities and events of journeys.

Chapter 8: Knowing and doing city cycling concludes the thesis. The contributions and limitations of the research are outlined. This final chapter shows how foregrounding the more-than-instrumental encounters of the embodied, relational, and affective practices of cyclists within urban environments by deploying mobile methodologies opens up new ways of knowing and doing city cycling.

Chapter 2 From instrumental to more-than-instrumental accounts of cycling

The discourse of the cycling-as-transport approach which centres on a rationalising, instrumentally-orientated cycling subject was outlined in Chapter 1. An example of the failure of the *build it and they will come* transport logic to realize the National Cycling Strategy's key goal of doubling participation rates by financing a range of on-road and off-road infrastructures demonstrated the limitations of adopting just instrumentally-based approaches and knowledges. While the inclusion of the National Cycling Strategy clearly illustrates the timeliness and significance for thinking beyond such approaches, the thesis is *not* about investigating why people resisted the policies, infrastructure investments and programs of the strategy. These details will be left to the authors and architects of the strategy. The challenges – and the opportunities – for this cycling study lie in creating a different cycling subject, one that is less in the grip of transport-centric knowledges. This chapter aids this process by firstly exploring the instrumental accounts of everyday urban travel to understand their strengths and limitations. The chapter then moves to reviewing other non-instrumental discourses, presented here as more-than-instrumental accounts of cycling.

'Instrumental' and 'more-than-instrumental' are two key, reoccurring ideas throughout this thesis. Instrumental knowledge and approaches were introduced and defined in Chapter 1 as being equivalent to utilitarian transport knowledge and approaches. This was summarised in a number of ways, including the notion of *cycling-as-transport* captured in the chapter title and epitomised in the National Cycling Strategy, in which outcomes are construed as things which follow inevitably given certain conditions. Cresswell's (2010) unifying theory of movement, representation and practice as interrelated dimensions of mobility also offers a framework which readily accounts for the *instrumental*/*cycling-as-transport* and the *more-than-instrumental* dimensions of this research. This chapter uses the academic literature to further clarify these instrumental and more-than-instrumental dimensions. The opportunity that lies in mobilities thinking and in practice-based investigations such as this research is to widen agendas in terms of what is considered necessary and practical research for understanding daily bicycle travel in cities.

This chapter is arranged into three sections. The first evaluates the instrumental empirical research which has become the basis for the dominant understandings of urban mobility. This research is compared and contrasted at times with specific examples from the transport/mobilities interface to illustrate how different, practice-based accounts can overcome the limitations of instrumental understandings. The second section lays out the theoretical pathways for producing more-than-instrumental knowledge of the mobile practices of cycling on which the present study is founded.

The third section deals with the emerging trajectories of more-than-instrumental research into everyday mobility. These accounts are not limited to research on cycling. Relevant accounts are to be found in other forms of everyday travel, such as walking, driving, and public transit. One approach which summarises and orientates the direction for this research can be found in Latham and Wood's study of urban cycling in London: 'Rather than approach infrastructure from the perspective of its provision, management and maintenance we want to look at some ways in which urbanites go about the task of dwelling within, or inhabiting, infrastructural spaces' (2015, 301). This work centres the moving cyclist to understand the less cognitive capacities and embodied tactics used in negotiating roads and traffic. A brief, final section transitions this chapter to Chapter 3, in which the methodology and methods for researching the mobile subjects of this research are set out.

Instrumental accounts

This section examines the ways in which cycling is viewed through the conceptual lens of cycling-as-transport as an instrumental encounter with the city. Transport refers to the logistical aspects of getting from A to B, such as route, speed and travel time. Transport data are typically formalised as equations and theorems, turned into algorithms to systematically model traffic demand and flows (Keeling 2007) and focussed on measuring and mapping safety, risk, and economic costs and benefits. This instrumental rendering of cycling related to the health, economic, sustainability and environmental dimensions of cycling as active and sustainable transport is then used to inform policy and planning.

First, this section describes and evaluates instrumental accounts of safety and risk. Next, the instrumental accounts of the benefits of cycling and their role in shaping recent policy and planning agendas to encourage greater cycling participation are examined. Naturalistic

studies of near-miss incidents gathered from bicycle-mounted global positioning system (GPS) and video cameras are examined. The quantification of health risks through epidemiological studies is also examined. With more cycling infrastructure appearing in cities, studies using stated and revealed preferences to understand cycling infrastructure and cycling commuting patterns have become more common. Finally, the instrumental accounts of cycling as sustainable transport are examined. Through the lens of transport, this collection of instrumental accounts has come to dominate present-day understandings of cycling.

Safe cycling

Cyclists are at greater risk of injury than motorists in the event of a crash (Garrard et al. 2006). By analysing police and hospital records of injury rates due to road crashes in Sydney and Melbourne from 2000 to 2008, Garrard et al. (2010) observed that the injury rates for drivers had fallen markedly, while the rates for cyclists had not changed. The authors contend that while road safety measures have led to safer driving environments for drivers, these measures have had little effect on improving the safety of cycling.[6] Moreover, an increase in on-road cycling fatalities and hospitalisations over the decade 2004 to 2013 was observed, while fatalities and hospitalisations for all other modes of travel decreased (Hatfield et al. 2015). Evaluating patterns of safety and risk has become a substantial area of cycling research (Pucher and Buehler 2012).

The high rate of chronic disease in Australia and other western countries is a common theme in portrayals of the risk-reducing factors of cycling. Studies show strong correlations between regular commuting by bike and improved health outcomes, such as reductions in body mass index, cholesterol and blood pressure (Garrard, Rissel and Bauman 2012; Huy et al. 2008; Oja et al. 2011). Research reviews from Europe, North America and Australia demonstrate that obesity rates are inversely correlated to cycling rates (Bassett et al. 2008; Pucher et al. 2010). An important research area combines the incidence of chronic disease in cyclists and their exposure to crash injuries. These studies produce an overall risk profile for everyday cycling which is used to contend that, over time, on average, people who cycle have an

[6] In all Australian states and territories bicycles are legally classed as vehicles, and roads are considered to be the usual place for cycling though cyclists can also legally cycle on footpaths in Tasmania (Tasmanian Government 2016).

overall lower mortality risk than those who do not (Bassett et al. 2008; Bauman et al. 2008). While studies are particular to local contexts and conditions, the overall cycling risk profiles are said to contradict 'the widespread misconception that bicycling is a dangerous activity' (Pucher et al. 2010, S106). While cycling *appears* to be considerably riskier than driving, overall cycling risk factors show a more complex profile of risk.

A safety-related argument for increasing cycling rates is the phenomenon of *safety in numbers*. Studies in cities in different countries indicate that there is a common thread linking increasing cycling rates with decreasing injury rates. Studies controlling for other influencing factors indicate that simply doubling the rate of cycling can reduce cycling injury risk factors by up to a third (Elvik 2009; Robinson 2005). This effect has been observed in a review of ten public bike-share projects in the UK where the rate of head injuries fell by 14% in the twelve months post-implementation (Graves et al. 2013). While this phenomenon is observed in different settings, the reasons for it are not well understood. It is thought that having more cyclists on roads raises the overall visibility profile of cycling in ways which increase driver attentiveness to the possible presence of cyclists. Jacobsen (2003) suggests that a greater penetration of bike use raises overall levels of community awareness, as more people driving cars have first-hand experience of riding bikes.

There are many studies linking better cycling infrastructure with safer cycling (Heinen et al. 2010; Pucher et al. 2010). There are different types of infrastructure, but for simplicity, cycling infrastructure can be categorised into off-road bike paths and on-road bike lanes. On-road bike lanes are separated from motorised traffic by line markings or more substantial barriers. In their international review of commuting by bicycle, Heinen et al. (2010) identified two overlapping types of safety: objective and subjective. Objective safety is the 'actual', statistical measure of unsafe cycling incidents and injuries. Subjective safety refers to how individuals perceive safety; in other words, whether they feel safe or not. Using these ideas of actual and perceived measures, Klobucar and Fricker (2007) found that the effects of bicycle infrastructure on objective safety remain unclear. However, the measures of subjective safety, in this instance the 'bicycle friendliness' of specific streets, increased when bicycle infrastructure was present. In contrast to Petritsch et al. (2006) and Pucher and Buehler (2008) argue that objective cycling safety measures improve with better infrastructure, more separation and lower street speeds.

Cars parked along the sides of roads can be dangerous for cyclists because of the risk of their occupants opening doors unexpectedly. Cyclists rate roads without side parking as safer than roads with parking (Stinson and Bhat 2003). In a study of motivators and deterrents to cycling, cycling adjacent to parked cars was found to be the third strongest deterrent to cycling, behind roads with heavy vehicles and high traffic-densities, and roads where speed limits are greater than fifty kilometres per hour (Winters et al. 2011). Dill and Voros (2007) also found that cyclists have a negative perception of roads with high traffic densities. Likewise, lower speeds and lower levels of traffic are often argued to have positive effects on bicycle modal share for those roads (Porter et al. 1999; Pucher 1998). Other studies found that cyclists prefer roads with two lanes to those with four (Petritsch et al. 2006). Four-lane roads are more likely to be busier, with higher speed limits and a greater share of heavy vehicles, all of which act to distract drivers from cyclists.

The continuity of bicycle infrastructure has also been shown to be important to positive perceptions of routes. Surveys indicate that cyclists prefer routes with more continuous infrastructure, and that cyclists dislike the sudden ending of bike infrastructure (Stinson and Bhat 2003). Continuity and smooth transitions are key elements of routes' 'bikeability', a measure used by Pucher, Dill and Handy (2010) to assess the overall quality of the cycling environment which combines safety-related infrastructure and traffic features. Stated and revealed preference studies show that bikeability appears to be more important for inexperienced cyclists than experienced cyclists, while total travel time appears to be more important for experienced cyclists (Winters et al. 2011).

What these instrumental, transport-based surveys and counts reveal are ways that infrastructure and traffic conditions can influence cycling safety. The important review though by Pucher et al. (2010) also reveals the contradictory or inclusive nature of findings across studies where certain conditions in one study have differing outcomes in other, similar studies. Cause and effect do not always follow as expected.

Near- miss studies

So-called 'naturalistic' research methods are becoming more common in road safety studies for understanding the experiences and behaviours of road users in their 'natural' everyday environments. The methods originate in driving studies using cameras mounted in cars to

study the behaviours of drivers (Neale 2005). Naturalistic studies are increasingly used to gather data on at-risk behaviours and near-miss events from the cyclist's perspective. Such methods are characterised by mounting video cameras on the cyclist's helmet or bicycle, and using GPS devices to track locations and times, thus producing large amounts of video and tracking data from everyday cycling journeys (Dozza et al. 2012). The detailed GPS tracking data logging position and time coordinates are converted to cycling speeds, accelerations, and decelerations, and are then matched to corresponding video footage to investigate, for example, sudden decelerations and changes in direction. Participant input into this analysis is taken into account but not, it appears, to any great extent. The quantitative approach of naturalistic methods is claimed to reduce the errors and post-event recall biases of qualitative approaches (Conche and Tight 2006).

In Australia, there have been two naturalistic, safety-oriented studies of commuter cyclists, one in Melbourne (Johnson et al. 2010) and one in Canberra (Johnson et al. 2014). These studies gathered data on cyclist-to-driver interactions from the cyclist's perspective using helmet-mounted cameras. The data were analysed using standardised quantitative methods for analysing traffic safety incidents. Johnson et al. (2010) argue that investigation of cyclist and driver interactions is important because cyclists colliding with motor vehicles are at over three times the risk of serious injury compared to all other crashes types, and cyclist-motor vehicle collisions are the most common type of collision (Rivara et al. 1997). The opportunity for this kind of research, as Johnson et al. (2010) further argue, is based on the fact that many similar but minor incidents go unreported.

Like naturalistic studies, variations on near-miss studies can offer insights into cycling safety issues through videoing and incident logging studies (Aldred and Crosweller 2015, in the United Kingdom), and internet surveys (Saunders 2015, in the United States). Yet by focussing solely on near-miss incidents, the qualities of the cycling practice keeping the cyclists safe are overlooked. So, rather than what went wrong in those near-miss moments, which is mainly attributed to driver inattention, near-miss studies fail to take the opportunity to evaluate what the cyclist is doing correctly throughout the rest of their journey to mitigate risk; perhaps, for example, cyclists become correspondingly more attentive to driver behaviours.

There is another issue with near-miss studies that largely problematise the relationship between cyclists and car drivers: cyclists are identified as the 'good' road users, and ever the victims of inattentive, uncaring, or even hostile car drivers. This is readily constructed as 'good' cyclists being at the mercy of 'bad' car drivers (Aldred and Crosweller 2015; Johnson et al. 2008; Johnson et al. 2010; Saunders 2015). This is understandable given cyclists' vulnerability and their often overlooked presence amongst larger and quicker motorised vehicles. But again, what happens across a journey? Does this simple binary neatly characterise on-road relationships, or are there more complex interactions, in which agency is much more distributed, at play between bike riders and car drivers? The conclusions reached by near-miss studies are almost inevitably a call for greater separation of bikes from cars. The binary of good cyclists and bad drivers arising implicitly or explicitly out of near-miss studies might obscure subtle more co-operative interactions at work keeping cyclists' separated and safe in the flows of traffic. There has been little work in this area, often because the video-based methods used to show interactions across the whole journey are orientated around what occasionally goes wrong (the near-miss) rather than what is almost always going right.

Patterns and profiles

Patterns of commuter cycling have been studied using transport mapping and analysis techniques. For example, cycling commuters are liable to live closer to their place of work than other types of commuters. It has been argued that because of the physical effort required, the resistance to travelling by bike has been observed to increase markedly with distance. Studies have identified relationships between commuting distance and the choice to cycle or not. Cycling distances of between one and four kilometres are most common (Keijer and Rietveld 2000; Rietveld 2000). Studies observe that women cycle shorter distances than men to work (Garrard et al. 2008). Howard and Burns (2001) suggest that the cut-off point is about seven kilometres for women and about twelve kilometres for men. Location is a factor, as are work activities and family responsibilities. The importance of distance is further reflected in the relationship between mode share and the size of the town or city. In Europe, it is the small to medium cities with a closer proximity of destinations that have the highest bicycle share (Martens 2004; Rietveld and Daniel 2004). Often, too, cycling does not serve as the sole mode of transport, but is used in getting to a train station.

Distance is linked to travel time, and transport studies comparing travel times have come up with interesting results. Up to 20% of trips in Australia are less than five kilometres (Australian Bureau of Statistics 2009). While the general public tend to overestimate travel times by bike, for distances up to five kilometres on busy roads, travel times measured as the time taken to get from 'door to door' are found to be often quicker by bike than by car (Martens 2007; Tranter 2004). Using the concept of 'effective speed', Tranter (2012) has developed a measure of travel time by considering the additional work time needed to fund car travel. What emerges is a profoundly different picture of travel times. The 'effective' speed of bikes is much closer to that of cars, even over longer distances.

Route preferences are also said to be influenced by the traffic density of intersections and the means of controlling traffic flows, such as stop signs or traffic lights. Cyclists were found to generally avoid traffic lights and stop signs when choosing a route because of the inconvenience of stopping and starting (Rietveld and Daniel 2004; Stinson and Bhat 2003) – slowing down and then accelerating again requires extra effort (Rietveld and Daniel 2004). Using geographic information system (GIS) data to reveal the route choice and travel behaviour of commuting cyclists, Aultman-Hall, Hall and Baetz (1997) found that cyclists tended to avoid intersections and uphill grades, but they still, overall, chose the shortest route.

In a similar study using GPS devices to understand route preferences, commuters were also found to be less sensitive to cycling infrastructure than to distance (Broach et al. 2012). While most stated preference surveys show cyclists' inclination to use off-road bike paths (Rose 2007; Shafizadeh and Niemeier 1997), the Aultman-Hall, Hall and Baetz (1997) study found their preferred routes were mostly road-based even when good quality, direct, off-road bike paths were available. What cyclists state, and what they reveal by their everyday practices, can be contradictory. While individual studies report the positive effects of bike lane infrastructure on cyclist numbers (Dill and Carr 2003), other research has found no change. Moudon et al. (2005), for example, report that the presence of more cycling infrastructure does not necessarily correspond to more bike riding.

Transport geography studies encompass socio-economic and demographic variables across spatial scales that shape cycle commuting patterns. Spatial variations such as housing and retail densities, employment and land use factors are mapped and analysed (Bonham and Suh 2008; Pucher and Buehler 2006; van de Coevering and Schwanen 2006). The extents to

which urban environmental factors, both built and natural, enable and constrain cycling are regularly studied by analysing patterns and volumes of movement. Street contexts, including street connectivity, footpaths and aesthetics, have been mapped and analysed. The terrain has been observed to be a more influential factor in shaping walking and cycling choices than the built environment (Cervero and Duncan 2003).

Low-density living and urban sprawl are often claimed to be major impediments to sustainability initiatives such as cycling (Saelens et al. 2003), but the accessibility of many Australian neighbourhoods to local cyclists, coupled with improvements to intra-city public transport, are claimed to develop different urban cultures of travel (Burke and Bonham 2010). This view is supported by using the modelling techniques of transport geography to interrogate the results of large, even nation-wide, surveys to map cycling travel choices in cities. Research in Germany has shown the prevalence of bike usage for local trips, but not for cross-city journeys (Goetzke and Rave 2011).The primacy of car travel in Australian cities through, and even within, local neighbourhoods, has seen the number of children walking and cycling to school decline steadily since the 1970s (Sharpe and Tranter 2010).

Cost-benefit calculations are a standard instrumental measure in evaluating transport infrastructure, with a ratio of 1.5 being considered a good return on investment (Kingham and Tranter 2015). According to Pucher and Buehler (2010), both on-road bike lane cycling infrastructure and the more cost intensive off-road bike paths are inexpensive compared to the cost of conventional car-based road infrastructure. A review of cost-benefit evaluations for cycling infrastructure across northern Europe and the United States shows an average cost-benefit ratio of 5.0 (Cavill et al. 2008), taking environmental, health and overall travel costs into consideration. With the annual cost of road congestion in Australian cities predicted to rise to around $20 billion by 2020, as reported earlier (Bureau of Infrastructure, Transport and Regional Economics 2007), the potential impact of increased participation in cycling on road congestion is claimed to be substantial (Cycling Promotion Fund 2008; Suh 2015).

The utility of cycling: what is known, what goes missing

Instrumental research on cycling maps and tracks, profiles and videos, surveys and risk-assesses the urban cyclist. Knowledge has been developed about who cycles and who does

not, and where, when and what for, as well as about cyclists' destinations, trip lengths and seasonal choices. The stated and unstated preferences for different forms of bicycle infrastructure, indeed whether bicycle infrastructure is preferred at all, have been fathomed. Cycling's long-term health benefits have been shown to outweigh the safety risks. The rational, risk-minimising cyclist is revealed in these instrumental approaches. But while there are dimensions of on-road safety that have been objectively measured and managed – car driving, for example, has become safer over time – the current methods for understanding cycling safety appear to be having much less impact. While one of the foci is what goes wrong in the moments of a near-miss, this needs to be widened to include understanding what is keeping cyclists safe across the array of moments that make up journeys. What fine-grained habits and practices enable the vast array of safe moments in a journey? What do the embodied practices of *safe* cycling look like; what do they feel like? What tactics are more apparent in cycling taking place on roads without any dedicated cycling infrastructure? Even for naturalistic methods documenting whole rides, how safety is enacted from moment to moment is obscured in the instrumental analyses of events that show what went wrong and who – almost invariably a car driver – is at fault.

The economic, health, well-being and environmental benefits of cycling have been costed, establishing the compelling logic for Australian cities to embrace the kind of cycling that is at the heart of the instrumental discourse of the National Cycling Strategy. However, despite the policies, promotion, planning and spending, Australians appear unconvinced, moreover unmoved, to take up more cycling. What other types of cycling knowledge were obscured by the instrumental approach exemplified in the failure of the well-resourced national strategy? For example, how is safety embodied and enacted across a journey, and what research methodologies can be used to gather and analyse the relevant data? It is in this context that more holistic approaches and theories are now examined along with the potential for generating more-than-instrumental knowledge of cycling, before moving to review the empirical literature. This work is re-positioning urban mobility, and city cycling in particular, in ways that foreground knowledge that is not constrained by transport-centric approaches and methods.

Mobilising theory

This section 'mobilises' a number of theories to develop a useful theoretical approach for researching and answering the research questions. While Cresswell (2013) and Thrift (2004b) refer to theory in the abbreviated sense of tools in a toolbox, theory runs implicitly and explicitly through 'all stages of geographical research' (Cresswell 2013, 5). In a manner of speaking, mobility thinking and theory are setting the 'pace' for this research. This section is divided into three parts. First, the origins and significance of mobility theory and thinking are examined. One particular theoretical mobility approach foreshadowed in Chapter 1 (Cresswell 2010) is examined in more detail. Next, theories of habit and practice are examined. Finally, to help account for the 'more-than or less-than rational' (Anderson 2006, 735) dimensions of practice, non-representational thinking is used to develop ways of 'reading' practices. Mobilities, non-representational theories and theories of habit and practice are the lenses though which the direction for this research becomes clearer.

Mobilities

John Urry's influential book *Sociology Beyond Societies: Mobilities for the Twenty-first Century* (2000) highlights the increasingly networked nature of societies enabling a diverse and ever-increasing flow of information, goods, services and people within and across the borders of nation states. Society, Urry argues, must increasingly be understood through what constitutes and enables its mobilities rather than simply through its social structures and territories. Similarly, Cresswell, writing on mobility as a 'geographical fact that lies at the centre of constellations of power, the creation of identities and the microgeographies of everyday life', questions the 'perceived prioritization of more rooted and bounded notions of place as the locus of identity' (2011, 551). There is a now a growing body of research and scholarship around mobility, no doubt reflecting this growing meaning and significance in our increasingly mobile society.

The emerging research focus on mobility has multiple beginnings, some of which are apparent in the work of scholars such as Mol and Law (1994), Cresswell (1999), Law (1999), and Urry (2000). Urry's argument that mobilities scholarship needs to focus 'upon movement, mobility and contingent ordering, rather than upon stasis, structure and social order' (Urry 2000, 18) has gained momentum, culminating in the declaration in 2006 of a

'new mobilities paradigm' or 'mobilities turn' in the first edition of a journal devoted to mobilities (Hannam, Sheller and Urry 2006; Sheller and Urry 2006a). This journal, *Mobilities*, was launched in 2006. In 2011, another mobilities journal, *Transfers: Interdisciplinary Journal of Mobility Studies*, was also launched.

There have been a number of edited collections on mobilities, including: Sheller and Urry (2006b), on mobilities, technology and cities; Elliot and Urry (2010), examining the local and global impacts of mobile lives; Cresswell and Merriman (2011), on mobilities and geography; and a handbook of mobilities edited by Adey et al. (2014). In addition to Cresswell and Merriman (2011), there have been several key texts for geographers, including Adey (2009), on theory, politics and practices, and Edensor's (2010) edited collection on the geographies of rhythms. The edited collection of Bissell and Fuller (2011) highlights the often neglected forms of stillness in mobilities scholarship. The idea of a 'new mobilities paradigm' or a 'mobilities turn', though, has been questioned by Cresswell (2010). While he maintains that substantive bodies of mobilities research prefigure the 2006 'announcement' of the mobilities turn, Cresswell also acknowledges the overall, heightened tenor of theoretical and empirical work on mobilities.

The particular framing of mobility as transport, meaning and practice, introduced in Chapter 1, is a useful starting point for orientating the instrumental and non-instrumental set-up of this research. This approach is based on a particular theoretical interpretation of mobilities (Cresswell 2010; 2006) and developed by Cresswell (2010) as part of a 'mesotheory' of mobility. Cresswell's overall approach to constructing geographical theory is helpful for designing an approach for this research. Rather than insisting on a 'grand narrative', geography, for Cresswell, demands the construction of theories of the middle-ground – mesotheories – as more 'modest accounts of what geography does in the world' (Cresswell 2013, 263).

This theory of mobility informs this research in several ways. First, it establishes the relationship of the dimensions of practice, transportation and meaning. The emphasis is on three entangled but *equal* elements under the banner of mobility. Whilst transport thinking has historically dominated much of the urban travel discourse, the agenda of the mobilities turn has been, in part, to unsettle these perspectives by inviting new rounds of questions, theories, methodologies and research. Rather than ignore the dominant instrumental

perspectives of transportation, it is acknowledged here as part of the agenda but without privileging it over the practice-based focus of this research. This is needed in loosening the grip that utilitarian transport thinking has on framing cycling, allowing the space for other accounts. This is not to say that transport thinking is not a legitimate and critical form of knowing. The point is simply that the dominance of transport thinking has overshadowed other forms of knowledge.

There are two aspects to framing mobility in this research as transport-meaning-practice that need clarifying (Cresswell 2010). First and importantly, Kwan and Schwanen contend that this theoretical framing problematises transport geography research *and* mobilities research as 'an opposition rather than a contrast … transportation versus mobilities research' (2016, 245). This assessment overlooks the fundamental premise of Cresswell's mesotheory of mobility encompassing the realm of transport, and in this instance transport geography, along with those of representation and practice. Mobility and transport are much more entangled than oppositional. Moreover, mobility as movement-meaning-practice does not contradict Kwan and Schwanen's further contentions that 'transportation geography is internally heterogeneous … closely connected to and coevolving with the mobilities turn', and that 'parts of the subdiscipline [of transportation geography] can also be seen to generate new understandings of mobility and not merely movement' (2016, 245). Again, mobility as comprising movement + representation + practice does not contradict or even problematise notions of internal heterogeneity, connection and coevolution of transport geography and mobility. It also follows that new understanding developed in transport geography will inevitably enhance understandings of mobilities. Still, Kwan and Schwanen (2016) also point out that Cresswell's portrayal of mobility is perhaps the most influential and, by implication, the most useful conceptualisation of mobility to be developed so far.

The second aspect is that Cresswell uses the approach in developing a 'politics of mobility' (Cresswell 2010, 17) by identifying six 'mobile' elements implicated in the production and distribution of power: motive force, speed, rhythm, route, friction and experience. Along with the domains of movement, representation and practice, each of the six elements helps 'fine tune' mobilities within a concept referred to as 'pervading *constellations of mobility* – particular patterns of movement, representations of movement, and ways of practicing movement that make sense together' (Cresswell 2010, 18, emphasis in original).

The interconnectedness of transport, meaning and practice with motive force, speed, rhythm, route, friction and experience should not be overlooked, but for this research the focus is on transport, meaning and practice. Each of transport, meaning and – the focus of this research – practice, are considered to be meaningful domains of study. For Cresswell, the power of this approach is found in the way mobility overrides and unsettles established hierarchies (Cresswell 2011). In the end, though, 'it is at the level of the body that human mobility is produced, reproduced and, occasionally, transformed' (Cresswell 2010, 20). More-than-instrumental accounts of bodily mobility, though, have been overlooked, under-valued, and hence under-researched. The difficulty of researching mobile practices has also contributed to the dominance of instrumental accounts (Sheller and Urry 2006; Urry 2000). This overlooking and neglect of the critical more-than-instrumental realm of mobile practices of cycling opens up the space for this research.

What is also needed for researching cycling are ways of making sense of the relational and embodied aspects of cycling habits and practices making up a regular ride. The idea of mobility as comprising transport-meaning-practice is a key organising theory for this research. Typically, mobilities research works across multiple disciplines and is not centred on transportation approaches. The approach provides a structure for researching the habits and practices of everyday cycling but it is not without challenges. The challenges confronting mobilities researchers however also open up opportunities as Merriman writes:

> [M]aintain a plural sense of what mobilities research is, has been, can be and should be: expanding the number of disciplinary perspectives on movement and mobility; working across disciplinary boundaries; developing different theoretical and empirical avenues; drawing upon a plurality of methodological approaches; and *above all* adopting modest, 'weak', open, non-representational epistemologies and ontologies – not as a means to grasp and represent elusive practices, but as a means to experiment and move *with* (2014, 183, emphasis in original).

Theories that are open to the immediacy of mobile practices in an eventful world can disclose understandings of how cycling is routinely practiced in cities, how the materiality of urban roads, streets and traffic is encountered and negotiated by body and bike.

Practices and habit

It has been established that the overlooked dimension of cycling mobilities are the more-than-instrumental accounts of the mobile practices of cycling. Recently, Ravaisson's work (2008 [1838]) has become the source of a revitalised interest in the concept of habit. Habit is commonly understood as an inclination or disposition to act in a certain way, a customary act or a settled practice acquired through frequent repetition. This understanding often ties habit to the negative connotations of the repetitive behaviour of compulsion or automatism: an unthinking, mechanical action. According to Malabou, such understandings of habit as 'pure mechanism, routine process, devitalisation of sense ... the disease of repetition that threatens freshness of thought and stifles the voice' (2008, vii) were central to the emergence of modernity. In the work of Descartes and Kant, for example, habit is regarded as that which reduces the human action to the mechanical, and thus as the antithesis of rational action.

There is, however, a countermodern tradition of thinking about habit, tracing back to Aristotelian ideas of human virtue and social practice, which presents habit as fundamentally creative. Part of that lineage, traced through the work of Bergson and of Deleuze, is Ravaisson's *Of Habit* (2008 [1838]). This work has recently become more significant and influential than it has been for over a century. Elizabeth Grosz (2013), reviewing its contemporary relevance, writes:

> Habits change the disposition to action; they entail a change, a new virtuality, a new tendency to act, a new potentiality. They bring about a new ability, the capacity to persist, thrive, change and grow in the face of a world that is itself subject to endless and often random change. Habits provide the ability to change one's tendencies, to reorient one's actions to address the new, and to be able to experience the unexpected (Grosz 2013, 221).

Ravaisson counters the modernist assumption that a habit is simply a capacity or a vice acquired by an individual. Rather than taking habit to be a capability which is accrued and subsumed into the persona of an individual, Ravaisson argues that habit needs to be thought of as part of the ontological foundation of any social world. Decoupled from the circumstances of any individual, habit becomes an ontological practice that enables

personhood, rather than one that is harnessed and applied by fully-fledged individuals. What is also radical about Ravaisson's work is its assertion that:

> Habit is not coincident with 'individual' bodies but is part of the movement of life itself that brings bodies into being. Indeed the problem with many accounts of habit is that they tend to imagine bodies that are already-individuated prior to habit's work, rather than seeking to understand how habit is itself a force of individuation (Bissell 2014, 486).

Counter to the modern assumption that habits are brought into being by the action of bodies, Ravaisson argues that bodies are brought into being through a contraction or synthesis of past events. There is a need for living beings (and the higher the order, the greater the need) to acquire habits to stabilise and organise their world (Grosz 2013).

Movement is fundamental to Ravaisson's thesis. For Ravaisson, movement happens when an excess of power overcomes the forces of resistance. Further, consciousness of effort, says Ravaisson, arises out of the extent of and the relationship between power and resistance. Within effort reside two tightly coupled elements which are proportionally and inversely related to each other: these are action and passion. Effort is, in a sense, the site of equilibrium where action and passion, and consequently perception and sensation, come into relation. Effort is the common limit of these opposites, the middle ground where the extremes touch (Ravaisson 2008 [1838], 43). Within the repetition of action and passion, movement and desire, reside the processes of transformation. Through repetition, habit transforms its own condition by containing and condensing movement, so that over time, the activity becomes more efficient and effective. Here, habit, 'skeletalizes action' (Grosz 2013, 221) reducing the effort involved and, in doing so, it creates 'a new bodily mode of existence, the learning of a way of simplifying action'. While habits can also compact and compound activities into dull, repetitive routines, habits also provide the ability to change tendencies and reorient a person's actions.

Ravaisson is useful for studying cycling practices as a contraction of successive past events, but also as openness to future possibilities, 'the way all movements stretch beyond themselves to condition future movements' (Bissell 2014, 488). Contrary to Cartesian representations of habit as the reduction of action to an instrumental and mechanistic

reproduction of existing order, the potential rather than the constraining dimensions of habit are more useful in linking the dynamics of social order with creative possibilities for change (Bissell 2014; Carlisle 2010; Dewsbury 2011; Dewsbury and Bissell 2015; Grosz 2013; Malabou 2008; Sinclair 2011). The work of Ravaisson is increasingly evident in the mobilities field, in studies of walking (Middleton 2011), urban movement (Sharpe 2013), plane travel (Bissell 2015), and behaviour change to achieve low-carbon mobility (Schwanen, Banister and Anable 2012).

Non-representational theory

> If there is one single thing that can be said to characterise non-representational work in Human Geography over the past 15 years it is the attempt to invent new ways of addressing fundamental social science issues and, at the same time, displacing many of these issues into new areas and problems (Anderson and Harrison 2010, 2).

Research that focusses on everyday practices poses a number of challenges. How might delving into the actions and activities that take place in a milieu largely outside that of cognitive thinking be readily accessed, investigated and represented? How might meaning materialise out of the study of movement and actions that are intrinsically caught up in the nature of the doing? If the nature of the doing is one that can be portrayed as second nature (a second nature constituting a practice), how might it be accessed, analysed and ultimately represented? Or, to put it another way, how can an empirical 'grip' be established on a practice and carried through to meaningful research conclusions? The challenge of moving beyond established fields of study which more readily lend themselves to representation is one that non-representational theorists have taken up. Non-representational theory has sources in various traditions, disciplines, sub-disciplines and movements. According to Lorimer, the project of non-representational theory 'is entirely, quite avowedly, unmappable. Its own logic of radical revisionism does not permit the old subject-based maps of academe' (Lorimer 2007, 90).

Non-representational theory draws on a broad lineage of ideas and theories that are important to this research; in essence it points to a world brimming with movement and flux. For Nigel Thrift, a prime mover behind non-representational theory, ways of being in the world through

movement are the focus (Thrift 2008). Through non-representational approaches the world is understood as a lively place, and such approaches offer ways to 'describe theories of practice which amplify the flow of events' (Nayak and Jeffery 2011, 287). The embodied knowledge borne out of practice in a processual world full of flow and movement is seen as a crucial way of interpreting and understanding the world. Non-representational theory accounts for creative and eventful processes where accounts of the subject, the social and the world appear as 'an affirmation of life, of existence as such, as precarious, as active and as unforeseeable' (Anderson and Harrison 2010, 19). If everything is so open-ended, what then accounts for the long-term stability of social processes? For this theoretical approach, the stability of everyday process can be found in theories of practice and habit.

The work of Anderson and Harrison (2010) extends this work by summarising it into three key themes: a theme of practices; a relational-material theme of life and the social; and a theme of the 'event', the volatile happenings taking place in the world, ordering and reordering futures. Anderson and Harrison also address criticisms of non-representational theory (Lorimer 2007; 2008) as a movement paying little attention to its roots in human and cultural geography.

As a theoretical orientation, however, there are many aspects of non-representational theory that align with the present research. First, non-representational theory directs attention to a lively world full of motion and movement. Furthermore, much of our 'knowing' of our world takes place in dimensions beyond the cognitive. These dimensions are developed through moving and sensing in a mobile world. Affect, as a product of relations (Anderson 2006; 2014), is generated out of the immediacy of worldly encounters between things, human and non-human. It can be understood as a precursor to emotion, consciousness and will, and as such is often difficult to apprehend and challenging to represent.

All manner of activities, encounters and everyday practices are said to be infused with varying intensities of sensations, awareness, feelings, emotions and affect (Anderson 2014; Anderson and Harrison 2010; Stewart 2007; Thrift 2004). Affect and the 'affective turn' are said to promise much for a 'worldly geography engaged with life, one that pays attention to the subtle, elusive dynamics of everyday living and touches the texture of social life' (Anderson 2014, 7). Affect, however, is an elusive phenomenon, often hard to define and

research. While this study is not about affect *per se*, affect is an important and potentially useful consideration in making sense of cycling practices.

Shouse provides a starting point for understanding affect: 'Feelings are *personal* and *biographical*, emotions are *social*, and affects are *prepersonal*' (2005, np, emphasis in original). While Shouse orientates affect around *the individual*, Anderson draws a distinction by using *the encounter* as the starting point. This invites a shift to considering affect as 'transpersonal rather than pre-personal' (Anderson 2014, 87). By considering the affective nature of encounters, affect then becomes a more practical resource which can be orientated and attuned to the cycling-based encounters of rhythms, flows and events.

Embodied knowledge and understandings through the play of affect are likewise difficult to apprehend. Within cycling studies, the intrinsic place that affect and embodiment have in cycling mobility has begun to be explored, with accounts from Jones (2005; 2012), Spinney (2006) and Aldred (2010). While Cresswell has written of his concerns about non-representation theory (2012b; 2013), he remains open to the spirit of enquiry that non-representational thinking fosters, as it 'resists the idea that worlds are made textually and looks instead to moments of creativity and surprise in the way the world is performed' (2013, 228). Using non-representational approaches encourages accounts of the world in which meaning is found by delving deeper into the myriad interactions, negotiations and events which compose, for example, a cycling journey.

More-than-instrumental accounts

Using the overarching framework of mobilities this section focusses on studies which have taken more-than-instrumental approaches beyond those of transport. For example, Law (1999) has used the term 'daily mobility' as an alternative to daily 'transport' to open up more-than-instrumental research agendas on the social and cultural aspects of gender. This section reviews the empirical research beginning with the accounts of mobile habits and practices which privilege embodied corporeal accounts. There are also the particular ways that infrastructure and traffic is 'inhabited' in everyday mobilities and how these studies can diverge or complement one another.

There is a growing body of research that pushes beyond instrumental accounts to gain 'holistic' understandings of so-called active transport. One such study investigating both cycling and walking is that of Jones et al. (2012). The study used an array of methods from large surveys, household interviews and ethnographic observations to mobile interviews to explore subjectivities and reveal shared cultural and social meaning. These studies can overlook how people actually do their everyday urban mobilities, or at least obscure this critical dimension by focussing on subject-centred opinions and observations. What are lost are the non-verbal, gestural and embodied experiences in the actuality of travel. The problematic nature too of bundling quite distinct practices together under a label of active transport is noticeable in the selection of mobile interviews for cyclists (Jones et al. 2012). While mobile interviews can get close to the practice-based contexts of walking (Middleton 2009; 2011), they are often impractical and very often unsafe for cyclists (Spinney 2011). This point is taken up in the choice of mobile video ethnography as the mobile methodology for this research in Chapter 3.

Mobile habits and practices

'Practice' is the everyday sense of the 'doing' of mobilities, whether driving, passengering, walking or cycling. Mobility practices are, 'mobility that is enacted and experienced through the body' (Cresswell 2010, 20). Human mobility is performed and accomplished corporeally to produce the embodied and often habituated practices of travel. Practice brings together the 'internal world of will and habit … and the external world of expectation and compulsion' (Cresswell 2010, 20). Understanding those fleeting, ephemeral, embodied and sensory aspects of human mobility is critical, according to Lorimer (2005), if we are to fully understand why and how people move around.

How movement is carried out at the bodily level is under-researched and yet it offers the most potential for emerging mobility scholarship (Büscher and Urry 2009; Cresswell 2006; 2010; Thrift 2008). Under the umbrella of mobility studies, the mobile practices of people as drivers, passengers, pedestrians and cyclists have begun to receive greater attention. This work centres on how people carry out their everyday routines of movement in their cities and suburbs. It is productive, here, to look at walking, driving and 'passengering' in terms of movement-as-practiced. For de Certeau, the habitual and unconscious acts of daily existence, such as walking, are constituted in both the strategies that institutions use to bring the

material and representational forms and spaces of the city into being, and in the tactics used by citizens to navigate those spaces in a way that is never fully determined by the form of the city (1984).

More recently, studies of walking have shown how place is brought into being as part of the journey. The recognition of the pivotal role of bodily movement in enabling human comprehension of the world is a recurring theme in the work of anthropologist Tim Ingold. He writes of the reciprocal impression of body on landscape, landscape on body, in an ongoing act of co-production that emerges out of the activity of moving through the world (Ingold 2000; 2004; 2011). In this sense, walking is a way of opening the world to meaningful inhabitation (Ingold 2000; 2004; Lee and Ingold 2006; Wylie 2005). Rather than understanding walking, or other everyday practices, as instrumental means for achieving meaningful ends, attentiveness to embodiment and performativity reveals that meaning is intrinsic to such activity. In this view, everyday activities appear as an ongoing process of inhabitation; an ontological dynamic of both comprehension and embedding, knowing and acting.

Studies of the mobile practices of walking, driving and passengering take similar paths to those emerging in studies of cycling. They are repeatedly drawn back to central themes of sense and sensory experience, aspects that, until recently, have been routinely overlooked. For Spinney, mobility practices are loaded with 'fleeting, ephemeral and often highly embodied aspects of movement', and research 'is vital if we are to fully understand why and how people move around' (Spinney 2011, 162). Jones (2005; 2012) also points to the neglect of the affective and embodied dimensions of cycling. Beyond cycling, a general failure to appreciate how the geometric spaces of urban travel are converted into lived spaces has been noted (de Certeau 1984; Featherstone 2004; Thrift 2004a).

Studies of everyday practices, with and without direct mobilities associations, are highly diverse. Studies of the sensuous, corporeal, kinaesthetic experience, and mundane conditions of materiality and sociability have been addressed in relation to: airports (Adey 2006; 2007), air travel (Lassen 2006), mountaineering (Barratt 2011; 2012), travelling by car (Sheller 2004a), and the routine, everyday travel and movement involved in living urban life (Binnie et al. 2007). Travelling – irrespective of whether it is by car, foot or bicycle – is shown to be about much more than just efficiently getting from A to B (Jain and Lyons 2008; Middleton

2010; 2011; Spinney 2006). Research on travel time (Jain and Lyons 2008), cycling (Spinney 2007; 2009), train travel (Bissell 2010b; Watts 2008), emphasise the significance of people's experiences of moving through space and of their time on the move. This can be contrasted with Larsen's (2016) study of social practices and bicycle mobilities which relies largely on interviews to construct a view of practice using Shove et al.'s (2012) practice theory of materials, meanings and competencies.

Several influential research papers have taken new approaches to cycling practices (Jones 2005; Simpson 2014; Spinney 2007). Jones (2005) adopts a performative approach to illustrate how the city and body are made and re-made through everyday cycling to/from work. Commuting in urban road spaces creates an embodied understanding of the cityscape, one that is regenerated and renewed on each journey. Commuter cycling is again used by Jones (2012) to critically examine how everyday practices are created and disciplined through 'the interplay of sensory intensity and affective capacity' (2012, 646). According to Jones, policy and planning miss the point in encouraging the uptake of cycling while ignoring the capacity of aspiring cyclists to cope with the sensory load (or overload) of a ride; the prevailing presence of cars and drivers and the many, varied interactions among them and with cyclists are also underplayed there. The ability of an individual to cope with these chills and thrills, and their incorporation into policy and planning, is crucial in shaping those patterns of behaviour that develop into a practice.

Studies of mobility and everyday life are nothing new to geography. David Seamon highlighted the body-subject in the geographies of everyday life in 1979. Seamon argued that the body-subject learns through action. According to Seamon, movements become familiar and develop as choreographies of place, body ballets and space-time routines. Paul Rodaway's (1994) work on sensuous geographies, too, is an important account of body, sense and place. This work on how people perceive their world through the sensing mechanism of the body prefigures more recent and growing interest from human geography in affect, sensing and emotion.

The challenge with accounts of body, sense, place and time routines, as Middleton (2011) contends, is how to unpack and study these as mobility habits in the light of the often highly abstracted theoretical writings of Ravaisson (and similarly of Bourdieu (1977), and Merleau-Ponty (2002)). The recent work of Schwanen, Banister and Anable, however, does highlight

the possibilities that focussing on the mind-body-world assemblage formed through repetition has for low-carbon mobilities such as cycling. Their advice is to avoid privileging the rational mind, 'and to a lesser degree infrastructure over bodily capacities and tendencies, and [instead to] focus on body, mind and world in equal measure' (2012, 530). In other words, avoid privileging instrumental approaches, where outcomes are seen as predictable, over other approaches. The ways in which the manner of assembly of the mind-body-world might be practically applied to low-carbon modes of transport such as cycling remain unclear, except that, broadly, research needs 'novel, creative' pathways for reconfiguring 'carbon-intensive travel habits' (2012, 530). The present research is not focussed on the mechanics and strategies of habit change but on what actually constitutes the existing habits and practices of mobile subjects; it heeds the call for more novel research.

The lack of empirical work showing direct applications of Ravaisson's notion of habit in the activities of everyday cycling might be compensated for the opportunities presented by the openness of the field. Particularly important is the way in which habits work at an 'autopilot' level but can snap back into consciousness to deal with unexpected situations and events. This is what Ravaisson terms a middle ground, where the passive and the active meet, where effort and consciousness recede, thereby wearing down or weakening the effect of sensations and the force of effort. Cycling, it would seem, requires a channelling of effort which appears to diminish as bike riders become stronger and more adept at channelling effort. With the developing experience of a bike rider 'mobilised' as habit, cycling also appears to become safer, and more rewarding – as health and well-being studies increasingly show. There are also ideas of stabilising and balancing of physical and mental effort. The act (or even art) of cycling is deeply intertwined with balance, stability and instability. Cycling is a contingent undertaking in which there are ongoing forces at work: some are habituated in the continual practices and exerted efforts of stabilising the bike and rider, and other forces and events (gravity, very slow speeds, slippery roads, errant cars) threaten that stability. There are also possibilities for more profound transformations arising out of everyday habits (Ravaisson 2008; Schwanen at al. 2011), though again there is a lack of research demonstrating direct outcomes of such approaches.

Inhabiting infrastructure

In their review of the bicycle commuting literature through the instrumental lens of transport, Heinen et al. (2010) summarised the motivators and concerns of people who regularly travel by bike as cost, effort, travel time and safety. In a similar vein, Pucher et al.'s (2010) international review of infrastructure, programs and policies to increase cycling rates show that some key interventions are: promoting bicycles as active and sustainable transport, and; providing infrastructure to improve safety and 'bikeability'. The details change between the papers as to how this is best achieved, but the consensus seems to be that these (somewhat reductively) are the key factors and, by implication, the areas in which more research is needed to find solutions – usually infrastructure interventions. Other studies taking more than instrumental approaches and using qualitative methods can also, however, frame choices around push-pull factors in terms such as 'barriers and enablers' (Daley et al. 2007). Again, these barriers and enablers are portrayed as external conditions open to change or modification, thus making certain outcomes – choosing to cycle or not – seem inevitable.

The mobilities turn has highlighted the mobile subject, but stasis and fixity enable mobility (Cresswell 2006; Urry 2000). If cities are argued to be places of flow rather than (just) places of space (Castells 1996), cities are also places of infrastructure containing, regulating and distributing those flows. As much as electricity is contained and distributed by complex networks of transmission cables and wires, modern day road travel is enabled and restrained within complex networks of roads and streets (Graham and Marvin 2001). Like many developed cities, Australian cities are dense with infrastructure. The fabric of urban infrastructure, though, is often viewed as a backdrop to the real activity of everyday life. However, the central and ongoing structuring and restructuring of city life through the affordances of infrastructure has been highlighted through the lenses of critical urbanism (Graham and Marvin 2001; Harvey 2009; Hommels 2005; McFarlane 2011) and transportation (Schwanen 2015; Shaw and Hesse 2010; Shaw and Sidaway 2011).

In one major international review of cycling infrastructure (policy and programs) aimed to increase cycling rates, Pucher and Buehler comment on the lack of research and conclude that a 'wider range of studies would help in building the evidence base' (2010, S107). While their review was comprehensive, it focussed on studies using the orthodox instruments of transport research, such as stated preference surveys and traffic counts. As Spinney (2011) notes,

quantitative research focusing on instrumental factors tends to produce static and bounded accounts of travel experience. While explaining something about the rational factors of cycling, such studies fail to explain the more unutterable and non-rational 'meanings of cycling, which in no small part reside in the sensory, embodied and social nature of performance' (Spinney 2011, 163). Moreover, the problem with instrumental approaches lies also in the narrow range of methods reproducing the rational spatial order of transport and neglecting the affective and embodied dimensions of cycling. Techniques such as surveys can explain particular aspects of cycling but, as Spinney argues, they remain removed from its embodied practice – the context of *doing* cycling that is crucial to the creation of meaning.

In Tasmanian cities, and Australian cities more generally, the conventional road spaces are usually unadorned with cycling infrastructure. The amount of cycling infrastructure on Tasmania's urban roads is limited (Vreugdenhil 2011). It is plausible to suggest that even people cycling regularly may easily do so without encountering cycling infrastructure. How cyclists (and drivers) experience and use roads – how they inhabit them –, with or without cycling-specific infrastructure, is important to understanding city cycling.

Driving and cycling

Drivers are said to exert forms of possession and control over their traveling environment by 'inhabiting the car' (Urry 2006). 'Inhabiting' conveys the notion of the everyday and customary way of being and acting in place – in this instance, the lived aspects of driving. Car travel takes place comfortably isolated from the extremes of weather, noise and vibration, and, to an extent, from other road users. In contrast to cycling, mobility is achieved without the need to don special clothing to protect oneself against the weather, or a helmet to mitigate the risks in the event of a crash. There are also road spaces where a driver's (car) presence legitimises their right to the road over others' rights. The shared spaces of streets – spaces shared almost exclusively with other drivers – afford a 'rite of passage' to car and driver (Urry 2006, 26). Using the idea of a hybrid car-driver, Urry argues for a much more active consideration of the socio-material interactions of mobility.

Thrift (2004) takes de Certeau's seminal work *The Practice of Everyday Life* (1984) to examine how people go about individualising and modifying mass culture. Thrift uses de Certeau's work to explore the practices of driving; moving beyond the social exploration

considered by Beckmann (2001), for example. Drawing on the work of Katz (2000), Thrift argues that the practice of driving is irrevocably tied to how 'the identity of person and car kinaesthetically intertwine' (2004, 47) such that, when it is being driven, the car becomes an extension of the driver's body. These everyday practices of driving, however, have been absorbed into our 'technological unconsciousness' (2004, 47). They thereby become trivial and automatic (Merriman 2009). Similarly, Sheller (2004a) highlights the affective and embodied physical/material relationships that are brought into being as car and driver negotiate the urban landscape together. As much as cycling practices intermingle with other mobilities, cycling journeys are made on roads and in streets, enabled and constrained by material forms such as roads and infrastructures as Latham and Wood (2015) point out.

The differences between driving in a car and cycling on a bicycle can be readily construed as the dichotomous relationship between car and bike: mainstream versus marginal, unsustainable versus sustainable, and protected versus vulnerable transport. Three books on social and political cycling agendas use such approaches: Furness (2010), Mapes (2009), and Wray (2008). According to Jennifer Bonham (2011), this approach is often adopted by advocates of cycling and usually reinforces the dichotomy. However, by focussing too much on difference, the car can inadvertently become the centre of the argument, 'decentring' the bicycle. Bonham, however, advocates for approaches that centre cycling in a 'broader spatial and mobility context… conjuring a *culture of cycling* which values diverse mobilities' (2011, 145, emphasis in original). The difficulties in writing cycling into the centre of a text are not to be underestimated. For example, there are risks of valourising cyclists by portraying them as the victims of car-centric societies (Bonham 2011). Accordingly, there might be less entrenched and more subtle ways of understanding cycling which provide more effective ways of unsettling automobility.

Street spaces

One approach used by Bonham and Ferretti (1999) to deconstruct car versus bike binaries is to start with the street as the common space of travel. They contend that, over time, streets have been established by the transport sector as motor vehicle transportation corridors, precluding the possibilities of streets becoming more inclusive spaces for a variety of travel choices. Bonham and Cox (2010) extend this argument to the well-intentioned efforts of pro-cycling advocates lobbying for segregated cycleway, effectively maintaining road spaces as

the domain of motor vehicles and excluding a more heterogeneous mix of travel modes such as bicycles. Road spaces are normalised as places of driving while the normal place of cycling is construed as somewhere else. Apart from the difficulties of retrofitting large networks of cycleways 'somewhere else' into Australian urban spaces, segregating the 'space' of cycling can 'maintain rather than challenge existing road norms' (2010, 42). The conclusions of near-miss studies for example, where the imperative for more separation is argued, foreclose the possibilities of roads as more inclusive spaces where different modes enact a sharing of space safely and responsibly.

The centring of the overlooked cultural context of road spaces is found in the work of Merriman (2004; 2007) and Stewart (2014). Stewart's work in particular extends more than representational understandings by investigating the overlooked material assemblage of road spaces. Beginning with the mundane American road as an object and a space, Stewart conjures up an array of social and cultural 'road registers' which are 'generative, compositional and immanent to ordinary ways of living' (2014, 549). Her focus on the vibrant materiality of roads is used to establish roads as something other than placeless transport corridors. The recognisable, if overlooked, stuff of bitumen, lines, signs and grassy verges are argued to be sites that offer the possibility of greater freedom in understanding and expressing the richness of urban life. The value of Stewart's work lies in the way it challenges the boundaries of how roads are normalised and represented through more-than-instrumental approaches.

Unlike the large volume of quantitative research on cycling-specific infrastructure, until recently there have been very few qualitative studies about cycling in the context of urban road infrastructure apart from those researching their effects as barriers or enablers. Simpson (2016) above, Spinney (2009) and Latham and Wood (2015) are notable exceptions. Latham and Wood (2015) have studied how cyclists engage with or 'inhabit' the infrastructure 'settlement' of London roads configured mainly for motor vehicle (and pedestrian) movements. The rearrangement of existing road infrastructure by the installation of cycling infrastructure can trigger complex and adverse reactions from road users and local communities (Vreugdenhil and Williams 2013). Kidder's (2011) work on cycling in the midst of urban business districts, while specifically concerned with bicycle messengering, is another study showing how cycling subcultures inhabit urban spaces. Spinney (2010), re-reading the space *and* time of urban spaces through the everyday cycling practices of

improvising rhythms, shows a different, non-motorised encounter with the functionalism of transport infrastructure. Spinney demonstrates how affects and meaning are produced out of the time-space rhythms of urban cycling. What this work accomplishes is to weave the mobile, *moving* bike rider into the frame of infrastructure 'inhabitation'.

Mobile inhabitations

The generally overlooked affective and embodied aspects of cycling – the interplay of various human and nonhuman agencies – is emphasised in some scholarship. One important conceptual move here reframes the approach to understanding how experience and meaning are made through practice. Spinney (2006) takes Augé's (1995) 'non-places' of modern-day travel, such as roads and junctions through which drivers automatically move without any sense of regard or engagement, and frames them as dynamic, embodied and affective spaces for cyclists. For the cyclist, these so-called non-places are brimming with sensory experience such that a journey becomes a 'place of sense', in contrast to the more static and situated metaphor of a 'sense of place'.

More diffuse experiences and meanings such as 'bikeability' and 'wellbeing' are commonly discussed in general terms without linking them to cycling contexts as such (Jones et al. 2016; Whitaker 2005). Where wellbeing is addressed specifically in cycling studies it is most often included as part of the concept of 'health and wellbeing', and is used as a measure of change resulting from a controlled intervention. For example, Crane et al. (2015) adopted a psychological measure of wellbeing to study the frequency of cycling and changes in participant's quality of life, and Whitaker (2005) explored the effects of intensive rates of cycling exercise to draw an association with physical and mental health and wellbeing. While Simpson (2016) does explore the capacities of infrastructure and planned interventions to create felt experiences or 'affective atmospheres', and notes the need for wider investigations of the affective atmospheres of cycling milieus beyond just planned infrastructure, there is no linking of 'wellbeing' with 'affect atmospheres'.

Ideas of the performative nature of cycling travel pivot on cycling as an everyday practice. The work of geographers has made key contributions to cycling mobilities and practice in the UK (Aldred 2014a; Jones 2005; 2012; Jones and Evans 2012; Jungnickel and Aldred 2014; Latham and Wood 2015; Spinney 2006; 2011), Europe (Jensen 2013; Larsen 2013; 2015) and

Australia (Bonham and Johnson 2015). Jensen (2013) develops the mobility-as-performance analogy further by examining its 'staging' through streetscapes designed and planned by authorities; performances are 'being staged' through the thoughts and feelings, and actions and practices of individuals variously empowered (even if not explicitly authorised) to make or remake a city's transport system.

Aldred (2010; 2013) shows how practice and representation overlap when individual actions inform the construction of group identities and culture. This complements Kidder's (2006; 2009) work on bike messengers in city centres. He argues that their identities are made within those spaces through cycling practices which emerge from encountering the often confined layout of these inner urban spaces combined with crowded streets and pavements. Fincham's (2007) theme of identity arising out of practice can also be discerned in the work of Wray (2008) and Mapes (2009) on activism, and in Ruff and Mellors (1993) and Brown, Dilley and Marshall (2008) on mountain biking. These studies, however, are less forthcoming on how identity might be formed through everyday mobile practices rather than acquired through being aligned with this or that type of bike riding.

Simpson (2011; 2014) has used 'video ethnography' to study the embodied experiences and sensory perceptions of a cycle-commute through Plymouth, UK. Watching the video's detailed record reveals often subtle variations in routes and speeds, and elicits participant recollections of their changing experiences during different segments of their ride. Simpson and Spinney (2011) have argued that the mobile methods of video ethnography allow researchers to 'get close' to, and apprehend, the affective and embodies practices of cycling which are not disclosed by traditional, instrumental methods. The merits and place of video ethnography, though, have been questioned. Merriman's (2014) misplaced contention that the diverse range of methods for researching mobility has been conflated with those of mobile methods overlooks the essential arguments made by Simpson and Spinney. Encouraging the uptake of video ethnography to investigate mobile practices does not foreclose on traditional methods any more than it does on other, more-than-instrumental avenues; it simply adds to the already diverse array of methods for researching mobilities.

A more-than-instrumental approach

In 2007, Horton, Rosen and Cox pointed out that cycling remains remarkably unexplored in the social sciences. Almost ten years on, cycling is researched more extensively, yet the dominant discourse still depicts cycling-as-transport. The focus on cycling infrastructure and calculated intervention has not brought about the desired transformation to shift cycling from the margins of everyday travel closer to the centre. Re-thinking what counts as knowledge and understanding is crucial. In their review of the bicycle commuting literature, Heinen et al. note that 'predicting and influencing bicycle use needs to be grounded in other kinds of knowledge than those currently available for motorized forms of transport' (2009, 59). Mobility theory offers an expanded and enhanced account of cycling beyond the limits and exclusions of transportation rationalities. Studies of the mobile practices of cycling have begun to open up new cycling discourses which expand instrumental agendas beyond the usual scripts of safety and risk, sustainability and commuting patterns, health and wellbeing. While this work can often be emergent, the work of geographers in particular has been to insert the contexts and capacities of embodied experience, affective atmospheres and relational-materialities as critical yet underexplored dimensions of everyday cycling practices.

Instrumental research and planning has produced a 'disembodied' knowledge of cycling in which the embodied and relational doing of cycling is at best overlooked, and at worst hidden. Instrumental approaches are necessary but far from sufficient to understand cycling. The more-than-instrumental approach of this research draws on the emerging fields of mobilities studies and non-representational theory and related post-structuralist accounts of habit. The aim of the research is not to counter dominant instrumentalist research on cycling by claiming to produce a non-instrumental study. Rather, the aim is to supplement, extend, and deepen existing knowledges of cycling. The following chapter establishes the methodology and methods for researching the mobile cycling subjects of this study.

Chapter 3 Researching mobile subjects

> As many cities, societies, and citizens face up to the limits of current forms of mobility … researchers are finding it imperative to move beyond existing simplistic understandings of why people move and what mobility means, and beyond simplistic techniques for representing and mapping movement. Mobile methodologies will be increasingly crucial to these proliferating fields (Sheller 2010, x).

Much cycling research has been shaped by the conventions and methods of transport research. Transport studies rely on the methods of measuring, mapping and surveying to understand the logistics of cycling. With recent work in the social sciences, the social and cultural nature of cycling is becoming better understood. There are, however, still gaps in this knowledge. A founding premise of this study is that the very act of movement is often lost in static and undifferentiated accounts of cycling. The muscular, affective and sensate human body disappears in conventional studies which primarily quantify the timing, duration, frequency, direction, distance, speed and efficiency of trips made in this particular transport mode. Similarly absent is the coupling of this body with the bicycle, and their combined capacities and associated encounters with urban landscapes and infrastructures. As shown in Chapters 1 and 2, the instrumentalist focus on cycling-as-transport provides accounts of mute technologies, disembodied minds and self-evident actions, and is incapable of revealing the flows of meaning, value and relation that also constitute cycling practices.

This study is founded on the situatedness of cycling knowledge in the performance of cycling. The research is supported theoretically and empirically by methodologies and methods that come under the banner of the 'mobilities turn' (Adey 2006; Adey et al. 2014; Bissell 2010a; Cresswell 2006; 2010; Edensor 2010; Merriman 2004; 2014; Sheller 2004b; Sheller and Urry 2006; Spinney 2011; 2015; Wylie 2005). Mobilities research has challenged the limitations inherent in existing methodologies that assume social and cultural phenomena to be somehow essentially static (Büscher and Urry 2009; Büscher, Urry and Witchger 2011a; Fincham, McGuiness and Murray 2010; Hannam, Sheller and Urry 2006; Law 2004; Law and Urry 2004).

This chapter outlines the design of the methodology and the selection of methods used to research the mobile practices of cycling. Using the arguments set in train by the mobilities turn, the range of mobile methodologies is examined and the choice of mobile video

ethnography for this study is explained. Next, the mobile methods of video ethnography are outlined, and the decisions to include the co-agential entity of the bike-rider in the analysis, as well as the storyboarding of findings are explained. The Tasmanian locations and settings of the fieldwork are described, along with the participant recruitment process. The final sections transition the thesis into the next three chapters, which concern findings, by presenting a summary of the participants, their bicycles, and their rides, as well as a summary of the theme-based findings.

Mobilities and methodologies

Qualitative research is an extensive and evolving field of inquiry that enables data-rich and meaningful insights into social worlds:

> Through qualitative research we can explore a wide array of dimensions of the social world, including the texture and weave of everyday life, the understandings, experiences and imaginings of our research participants, the ways the social processes, institutions, discourse or relationships work, and the significance of the meanings that they generate (Mason 2002, 1).

Qualitative research draws upon the experiences, interactions and interpretations of research participants to generate explanations of social phenomena. But what might comprise the 'social', and who counts as a participant, has undergone radical reinterpretation in recent years. Notable here are John Urry's *Sociology Beyond Societies* (2000) and Bruno Latour's *Reassembling the Social* (2005) for their shifting of traditional perspectives on social phenomena beyond human-centred ontologies and epistemologies. In addition, the established and privileged patterns of social science research struggle to apprehend a world increasingly on the move. Social relations are more and more shaped by both global and local flows and movements. The notion of 'society' is failing to provide sufficient analytical 'grip' (Urry 2000). For too long the approach of social science has been to overlook the flow of people, things, services, knowledge and information.

Over a decade ago, two leading proponents of the mobilities turn, John Law and John Urry, argued that existing social research methodologies and methods fail to adequately equip mobility researchers:

> They deal, for instance, poorly with the *fleeting* – that which is here today and gone tomorrow, only to reappear the day after tomorrow. They deal poorly with the *distributed* – that is to be found here and there but not in between – or that which slips and slides between one place and another. They deal poorly with the *multiple* – that which takes different shapes in different places. They deal poorly with the non-causal, the chaotic, the complex. And such methods have difficulty dealing with the *sensory* – that which is subject to vision, sound, taste, smell; with the *emotional* – time-space compressed outbursts of anger, pain, rage, pleasure, desire, or the spiritual; and the *kinaesthetic* – the pleasures and pains that follow the movement and displacement of people, objects, information, and ideas (Law and Urry 2004, 403-404, emphasis in original).

Drawing on his work in the field of science, technology and society studies, Law argues that the messiness of social phenomena predisposes research methods to act as two-way *exchanges*, rather than one-way productions of understanding and meaning. That is, methods 'not only describe but also help to produce the reality that they understand' (2004, 5). Law's concern is that multiplicity, fluidity and instability are simply beyond the reach of much of social science research, and will remain so while methods are deployed as a means to impose order and rigour. Accordingly, social science research needs innovation and reform if it is to do justice to the 'mess' of social phenomena, rather than providing sanitised, limited and distorted accounts of social order. One aspect of the messiness of social phenomena is their flux: their continual shifting and movement. Mobilities approaches offer a way forward for understanding social complexity – for greater real-world veracity in the social sciences.

The mobilities turn has destabilised the ontological foundations of a social science that engages the world as theoretically and epistemologically static. That is, the world as fixed and given. This static ontology produces reality as though it were made up of fundamentally stable, ordered and discrete entities (things, beings, objects). Within this encounter, entities move in time and space, but do so in ways that enable them to retain their coherent composition and character. In contrast, mobile methodologies suit projects that seek to examine reality as itself – on the move, comprised of entities that are emergent, processual and relational. To apprehend this reality, to translate it within epistemological frameworks, researchers are challenged to participate within it, to move with it, recognising that interactions in and through space and time are the rule, not the exception.

Mobilities approaches invite important questions about the study of everyday practices and about what count as necessary phenomena for social research (Büscher, Urry and Witchger 2011a). Until now, research has been under the banner of transportation, where the more readily represented and more easily articulated understandings have come to the fore, such as travel time, traffic counts, costs and safety. The mobilities turn, however, suggests that the fleeting, the ephemeral, the multiple, the sensory, and often embodied, aspects of movement need to be researched to more fully understand how and why people are mobile (Adey 2010; Bissell 2010a; Laurier et al. 2008; Spinney 2006). Instrumental research on mobility is simply not enough; research using methodologies that can elicit more-than-instrumental knowledge of mobilities holds the promise of delivering more holistic, and ultimately useful, understandings.

Methodologies are required that foster 'openness to uncertainty, situatedness, feedback effects and reflexivity' (Büscher et al. 2011b, 120). In responding to this growing insistence, research has become 'mobilised'. There has been an array of relevant work conducted across the fields of (auto)ethnography (Cook and Edensor 2014; Larsen 2013; Spinney 2006), mobile ethnography (D'Andrea et al. 2011; Simpson 2011), and video ethnography (Brown and Spinney 2010; Laurier 2010; Pink 2001; 2007; Spinney 2011; 2015). Mobile methodologies have been featured in several edited books (Adey et al. 2014; Büscher et al. 2011a; Fincham et al. 2010).

Mobile methodologies: mobile video ethnography

Researching mobile subjects also requires practical methodologies to gather, analyse and interpret empirical data (Fincham et al. 2010; Hein, Evans and Jones 2008; Laurier and Lorimer 2012; Lorimer 2010). One of the key problems for mobilities researchers studying the mobile practices of mobile subjects such as cyclists is their very mobility. The fieldwork, the empirical work in the field to 'capture' contexts and experiences of bike riding subjects, is caught up in the context of a field(s) that is ever on-the-move. Using traditional research methods such as ethnography can be problematic. As Katz notes, location is often a key factor in ethnographic methods as 'we must have a "field" marked off in space and time' (Katz 1994, 67). And also, as Bryman (2012) points out, ethnographic research still tends to be carried out in only one or a few fieldwork settings. For mobile subjects, the ethnographic location moves in space and time.

D'Andrea (2006) argues that to adequately understand mobilities, a set of mobile methods that move with mobile subjects is needed:

> As in the metaphor of a stockcar race, the ethnographer must expand her perception of movement by going beyond the spectators' gallery viewpoint. By engaging as a pilot, the analyst will then perceive and experience the trembling of slowly moving entities running at high-speed through blurred surroundings (D'Andrea 2006, 114).

Researching how mobile subjects perceive and experience their everyday mobilities through sensory and embodied practices can be challenging, though. The embodied and affective, material and relational aspects of practices are difficult to trace and record, even with more static subjects (Crang 2003; Thrift and Dewsbury 2000). While accounts of mobile methodologies stress the opportunities for investigating mobilities by going along with mobile subjects, there are challenges in researching cycling mobilities (Brown and Spinney 2010; Fincham et al. 2010; Spinney 2011). Researching the 'doing' of cycling can be difficult and, what is more, unsafe. The fieldwork research methods of direct observation, note-taking, or talking with cyclists on-the-move can be limiting, disruptive, and even hazardous (Spinney 2009; 2011).

Motivated by a desire to get close, and stay close, to mobile subjects without disrupting, much less modifying, their practices, researchers have begun to make use of video cameras. Pink (2007; 2008) has demonstrated the use of video as a way to apprehend and share the place-making experience of people in their local neighbourhood. In this instance, the video becomes a representation of how places are 'made' through the sensory and embodied experiences of walking-in-place. Working with dashboard-mounted video cameras in cars directed at the occupants, Laurier (2010) has recorded and analysed car driving and 'passengering' to gain insights into life on the road. Garrett (2010; 2011) used digital video filming methods to explore and represent urban places normally inaccessible to researchers.

The mobile methodology of mobile video ethnography allows researchers to get close and stay close while recording cycling subjects in the midst of their mobile practices with minimal intrusion by using video cameras mounted on bikes or worn on helmets:

> [V]ideo can help participants and researchers alike bring into focus aspects of practice that have previously been blurred or out of shot. The advantage of incorporating a

> medium like video into the existing methodological tool kit is that the researcher can begin to explore how people use space and their bodies, how people interact with space, understand where and how they look, and ultimately gain a far more nuanced idea of how participants derive meanings through movement (Spinney 2009, 828).

Video recordings are produced by tracking the bicycle riding participant with a camera mounted on a bicycle ridden by the researcher. Mounting the camera on, for example, the handlebars, and following the mobile subject at a discreet distance is a mobile method termed a 'go-along' (Spinney 2011). The participant might also elect to self-video by using a camera attached to their own helmet or handlebars, thereby enabling a 'virtual' go-along. Video recordings are used as stimulus material in conjunction with the established method of participant interview.

There is a perception among some mobilities researchers that the mobile methods of going along with mobile subjects somehow backgrounds other, perhaps more traditional, mobile methods. Merriman argues:

> The debate about 'mobile methods' is in danger of shifting from a discussion of the diverse array of methods which can facilitate mobilities research in different ways to a focus on methods that the researcher must move with their research subjects. This difference appears to arise from the conflation of 'methods for mobilities research' with 'mobile methods' (2014, 2).

For this study, the theoretical framing of mobilities as encompassing transport, meaning and practice does not presuppose mobile methods to be the *only* method of mobilities research. As Adey et al. point out, mobile methodologies (such as mobile video ethnography) 'add to our repertoire of techniques for gathering data, rather than replacing those which already exist' (2014, 504). For Heath, Hindmarsh and Luff (2010), using video methods to gain analytical insight into everyday social interactions offers, at the very least, the possibility of supplementing conventional methods:

> If the key principle of qualitative research is taking the participant's perspective seriously and prioritising the resources on which people rely in accomplishing their everyday actions and activities, then a technology that enables the repeated, fine-grained scrutiny of moments of social life and sociability would seem to provide, at worst, a complement to the more conventional techniques for gathering 'scientific' information, at best, a

> profound realignment in the ways in which we analyse human activity (Heath et al. 2010, 2-3).

The methodology of mobile video ethnography was chosen for this research as a means of researching mobile subjects to move beyond instrumental approaches.

Mobile video ethnography: methods

Choosing to use mobile video ethnography entails another set of choices. This section outlines those choices, beginning with the data gathering methods of videoing and interviewing. The choice of NVivo data management software and thematic analysis for collating and analysing the data is then outlined. Presenting video and transcript data together can be problematic: the nascent methods of the 'graphic transcript', and the development of a means of representation here called 'storyboarding', offer a way of overlaying video stills and transcript extracts so that they can be analysed as findings.

Videoing

The go-along is referred to as a 'follow-along' in this research to stress the position and nature of the research presence, accentuating this physically close but unobtrusive research presence filming the participant from a safe distance behind. The bicycle-mounted researcher is well-placed to follow and, largely by necessity, mimic the moves, movements and practices of the participant. Following a participant by bike requires the aligning the researcher's own bike riding comportments with those of the participant. The researcher, then, is moving with the participant by being there, seeing there, and even feeling there (Spinney 2011). In doing so, embodied insight into the movements and rhythms of the participant's particular ride is gained.

Contemporary sports video cameras are portable and robust, and record vision and sound. They are well-suited to mobile video ethnography. These compact digital cameras are designed to be used for unrestricted, 'hands-free' filming. The camera used for this research was readily mountable on bicycle handlebars (Figure 3.1) or helmets (Figure 3.2). The camera was fitted with a wide-angle lens, enabling a more expansive view of the participant's cycling milieu. For example, peripheral views of cars overtaking from behind come into view earlier than would otherwise have been possible and this, in a sense, mimics the way our

peripheral vision functions. The combination of clear, high definition image streams and wide-angle views allows participants to readily identify 'their' ride.

The presence of the researcher, though, was not obligatory – the option of self-videoing was also offered. This was more suitable for several participants. Self-recording, using a handlebar-mounted camera in one instance, and a helmet-mounted camera in two instances, captured different kinds of image stream. Self-recorded footage does not preclude the researcher from having the feeling of 'being there'. At times the vision generated by a helmet-cam induces the kinaesthetic 'feel' of a participant's riding gaze, right down to their regular head checks over their shoulder of passing traffic.

Figure 3.1 – The handlebar-mounted camera

Figure 3.2 – The helmet-mounted camera

Interviewing

Semi-structured interviewing is one of the most widely used methods in qualitative research for gaining insight into the thoughts, feelings and reflections of participants. Lying on the continuum of interview styles between structured and unstructured, semi-structured interviewing has a degree of predetermined order but retains flexibility (Bryman 2012; Mason 2002). Interviewing or, more precisely, *video-elicitation* interviewing (Spinney 2009) was used in this study, generating interpretive knowledge which was situated, contextual and interactive. The format was a relatively informal one-on-one, face-to-face exchange using a laptop computer to play (and sometimes to replay) the footage of participants' rides. It was designed to be closer to a conversation than a question-and-answer style of interaction.

Interviewing is more than 'having a chat', as Dunn (2005) points out. Part of my preparation was previewing the ride footage, reabsorbing the ride through the lens of the camera. I usually had several viewings, noting ride features and events for the interview. These were used as discussion points in addition to the list of interview questions (Appendix A). I used a digital audio recorder for the interviews rather than taking written notes to facilitate a free-flowing discussion. The laptop computer was arranged on the table or desk so that the screen was readily visible to both of us. The videos were the focus of the discussion; they were the primary way of eliciting the experiences and feelings of the journey. As participants watched, they talked through what was going on and what they were experiencing. The video could be paused and replayed to check and clarify the fleeting aspects of a practice which can easily go unnoticed.

The interviews varied in length from fifty minutes to over two hours in one instance. The venues were quiet corners in cafes, small university meeting rooms and, occasionally, the participant's home. Some interviews took place straight after the ride; others were within a few days, but all within a week of the final ride. The participants' ability to recreate the experiences of their ride through the medium of the video was not diminished over the longer intervals. Even some two years on, I have noticed that watching a video triggers an array of memories and feelings across the ride: the effort on a hill climb, traffic whooshing close on a main road, the sensations of a warm sunny afternoon, or the jolt of a rough piece of road.

The audio recordings were then transcribed for text-based analysis. Transcribing helps build familiarity with the data, and an understanding of the similarities and differences between accounts (Bryman, 2012). However, the process can be time-consuming, and so while I personally transcribed twelve of the eighteen interviews, the remaining six were transcribed professionally. At that stage, similar strands of data were beginning to appear between transcripts.

Problematic camera noise

The close proximity of the camera to both the bike and rider during the fieldwork, whether bike- or helmet-mounted, allowed the recording of an array of cycling-related sounds: the rattle of mechanical looseness, the clickety-click of gear changes, and the grind of brakes. On uphill climbs, my deeper breathing or that of the self-videoing participant could be discerned. There was also an overlay of assorted background sounds, such as wind and traffic noises. At times, this audio record enhanced what was otherwise primarily visual data. For the majority of the time, though, the audio was marred by persistent road riding rattles. The video footage, too, were sometimes marred by episodes of a related issue: excessive camera shake.

The most likely cause of both issues was traced to looseness in the handlebar camera mounting. The problem, however, remained elusive and hard to resolve. Riding a bike generates an array of mechanical rhythms and vibrations. At some level, cycling rhythms and vibrations are always present and never fully pacified. The episodes though became problematic when outbreaks of excessive shaking and rattling blurred the footage and 'contaminated' the audio record on all but the smoothest sections of a ride. Attempting to fix, or at best contain, the problem between rides had mixed success. Episodes of excessive camera noise came and went. After several of most problematic episodes I had to re-record the ride.

Throughout the analytical work, my perceptions shifted as I began to reconsider the nature and patterns of this visual and audio noise. Rather than just looking for the source of the noise, and ways of suppressing or eliminating it, I wondered what a different consciousness of noise might reveal:

> We contend that such 'noise' is very much part and parcel of doing mobilities research. It is this noise which makes the recordings more intelligible, not less, providing valuable

> insights into the frictions and turbulence created by mobile people and things. Rather than eliminating or complaining about the noise, we would encourage researchers to actually research the noise, as this is the very stuff of mobilities research (Adey et al. 2014, 503).

Rather than ignoring the noise, which at times was difficult to do, I began considering these ever-present, but mostly background, vibrations and rattles as part of the mobile practice of cycling, just as they are 'very much part and parcel of doing mobilities research'. The story of the problematic camera noise is taken up again in the research findings in the Chapter 5 theme of *shaking, rattling*.

Thematic analysis and NVivo

The choice of analytic processes needs to be driven by the research question, epistemologies and theoretical frameworks (Braun and Clark 2006). According to Rapley, 'you should analyse what actually happened – how your interaction produced that trajectory of talk, how specific versions of reality are co-constructed, how specific identities, discourses and narratives are produced' (2004, 16). This study used thematic analysis in conjunction with the data management and data analysis tools of NVivo (NVivo10 2012). Thematic analysis was chosen for its flexibility and accessibility. Thematic analysis is a relatively straightforward way of making sense of qualitative data by collating, aggregating and developing thematic patterns. In practice, thematic analysis is an iterative process, moving back and forth between steps in an ongoing process of 'testing the fit'. Drawing on Ryan and Bernard (2003), the key criterion used in establishing any thematic patterns in the interview transcripts was the participants' repetition of topics, metaphors and analogies. As Braun and Clark (2006) maintain, thematic analysis, used systematically, enables meaning to be generated from data.

Following Attride-Stirling (2001) and Braun and Clarke (2006), thematic analysis involved stages of data familiarisation, initial coding, searching for themes, reviewing and refining themes and, lastly, producing findings. NVivo was used in organising, retrieving and collating the data. The process of coding is a key early stage in the analytical work. Codes (called 'nodes' in NVivo) are words or short phrase 'labels' applied to sort and represent chunks of data. Patterns of codes are used in generating the themes. The themes became the building blocks for answering the research questions.

There are two general approaches to coding. The first is a bottom-up or inductive process emerging out of the data – a data-driven approach. The second is a top-down, or deductive approach, using theoretical frameworks. For this study, the interview transcripts were transferred into NVivo and the data coding began inductively. A starting point was thinking about cycling in the immediacy of moments, and then stretching timeframes to encompass the whole journey. Similarly, the concept of the moving bike and rider, in space and place, was another avenue for making sense of the data. An array of codes, and then thematic patterns, began to emerge. About a third of the themes had a temporal basis, another third were more spatial, and the remainder were a loose grouping of 'something else' relevant to the whole journey.

A top-down, interpretive framework was needed to help complement and organise the bottom-up inductive work. A paper by Bruno Latour provided an interpretive framework, a 'richer grid' (1997, 175), to work with:

> Deeper than the question of time and space is the very act of shifting-delegating, sending away, translating. We should not speak of time, space, and actant but rather of temporalization, spatialization, acrantialization (the words are horrible) or, more elegantly, of *timing*, *spacing*, *acting* (1997, 179, emphasis in original).

Using groupings of timing, spacing and acting, the themes were consolidated to nine in total with three to each group. These final themes are summarised in Table 3.3. The final table of themes, codes and coding density collated using NVivo is summarised in Appendix B.

Storyboarding practices

The data sources (video footage and interview transcripts) are different interpretations of cycling that notionally originate in the 'same' series of actions and events. The interview transcripts offer a well-established route for analysing and representing to wider audiences. The videos are a portrayal of the spatial-temporal practices of bike riding in Launceston and Hobart, and helped participants to articulate the experience of their everyday cycling practices. While video has much to offer to the analysis of mobile practices, events will not disclose themselves without any effort on the part of the ethnographer, rather, 'the video text is authored and interpreted like any other' (Spinney 2011, 172). In addition, for non-representational approaches based in movement and moving in its many forms, analysing the

moments and movements of a practice provides ways to make sense of phenomena. The challenge lies in systematically analysing the detail and context of movements and moving captured in the videos.

Can textual representations and video representations be somehow integrated to better understand and convey the nature of cycling practices? Mobile video ethnography provides a medium for generating narrative and images, each rendering the other intelligible. However, as Laurier points out:

> In drawing upon video, geographers have struggled over how to bring video into their texts, relying on either transcripts that lose the looks of the original events, or sequences of frame grabs that lose the words of those events (2014, 235).

Recent approaches in geography (Dittmer 2007; 2010; Goodwin and Goodwin 2012; Laurier 2014; McIlvenny 2014) have borrowed from a set of conventions popularised in comic strips, producing 'the graphic transcript' (Laurier 2014, 235). The graphic transcript provides a narrative structure using the classic comic strip conventions of time-sequenced stills, highlighting stills, image cropping, narrative commentary and speech bubbles (Laurier 2014).

For this research, the 'comic book grammar' (Laurier 2014, 235) of the graphic transcript was adapted as 'storyboarding'. Storyboarding is a matching of extracts from interview transcripts with stills selected from video footage, coupling the situatedness and immediacy of video images with the thoughts and reflections of participants *in the same rendering.* Storyboarding was produced in two styles. There are single image stills taken from videos and matched with the participant's words, which appear in speech bubbles linked to the in-the-view participant. For the self-videoed participants, not being in view allowed the source of the speech bubble to be located just outside the bottom of the frame. In the cartoon style, the relationship of the participant to the image and the speech bubble – their words and their view of the world – is self-explanatory.

The other storyboarding style used a sequence of six or eight stills taken over a period of about ten to fifteen seconds. Speech bubbles are used, and occasionally accompanied by my questions or comments (indicated by a darker blue background). Other sequences have no speech bubbles. These sequences are interpreted using my video, interview and personal observations. As Laurier (2014) argues, graphic transcripts provide useful ways of keeping

the transcript and video as an interconnected record of interactions and events in time and space. The storyboarding method also helps in analysing events and situations that are often quite difficult to grasp by just shifting back and forth between video and transcript.

Introducing the bike-rider

> People who spend most of their natural lives riding iron bicycles over the rocky roadsteads of this parish get their personalities mixed up with the personalities of their bicycles as a result of the interchanging of the atoms of each of them and you would be surprised at the number of people in these parts who nearly are half people and half bicycles (Flann O'Brien 1996 [1967], 85).

The focus of this chapter is a process for researching the mobile practice of cycling as a more-than-instrumental encounter with cities. However, in centring how cycling is practiced, it is possible to overlook the combination of rider *and* bike. Rather than approaching cycling as a particular achievement of the experienced cyclist alone, the theoretical basis of the research illuminates other relational entities. Cycling is a complex achievement of both human and non-human affordances and interactions. These interactions produce entities which operate *together* (mostly, but not always) in co-producing cycling travel.

Work on theorising material and social heterogeneity by Haraway (1991; 1997) and Latour (1993; 1999) has enabled the idea of the 'hybrid', a unique combination of human and non-human agencies. Forms of heterogeneity and hybridity are everywhere, insists Latour (1993). As Michael observes, these forms are circumstances not just of modern conditions but all conditions: 'Despite our finest modernist efforts at denying the "exchange of properties" between humans and nonhumans, this heterogeneous process of mingling continues apace' (2004, 8). Using concepts of human and non-human interchanges, Michael has developed a 'hybridic' entity or unit of analysis that he calls a 'co-agent' (2000; 2004). For example, Michael describes the existence of co-agential entities, such as bodies-and-boots, containing both human and non-human elements (2000, 122). Co-agents are also contingent formations, according to Michael. As much as co-agents appear to be cogent, ordered singularities, they are also prone to disorder.

Following Michael, and Urry's hybrid car-driver (2006), a co-agential entity was identified to highlight the human and non-human co-production of cycling. Without insisting on the

priority of one over the other, the bike and rider become the bike-rider. The bike-rider is an analytical construction, a useful unit of analysis for exploring the complex heterogeneous interactions of bike and rider that produce the synchronous movements and motion otherwise understood as cycling. The construction also highlights cycling as a socio-material process of ordering. The bike *and* rider become the bike-ride entity. The bike-rider becomes something other when the rider dismounts at the end of the ride or perhaps during a ride in a crash event. The analytical emphasis on the bike-rider is used to gain insights into cycling practices as productions of order without overlooking the possibilities of disorder.

Ensuring quality outcomes and ethical conduct

To ensure that the findings are meaningful, that the arguments are convincing, and that the research is of good quality, the research should be designed to be: credible, reliable and transferable (Bryman 2012; Liamputtong 2009; Mason 2002). Each concept is discussed below.

To be *credible*, research findings need to establish a fit between the source data and the thematic findings. Generating rich, thick descriptions and including examples of the participants' own words in the findings demonstrates how themes are generated. The storyboarding of video episodes and the accompanying of video excerpts with narrative also demonstrate that fit. The systematic treatment of data provides an 'audit trail' to strengthen the credibility and confirmability of the research. The choice, and appropriate use, of qualitative methods, such as in-depth interviews, video ethnography and NVivo data management, are a way of demonstrating that the data is being treated systematically and dependably (Bryman 2012; Mason 2002).

The *reliability* of the findings is supported by the use of NVivo to manage the data clearly and consistently. Using video and interview methods also allows the research question to be explored in a 'rounded and multifaceted way' through triangulation (Mason 2002, 190). There are also the methods of: purposive sampling of participants, the use of multiple participant sources, and 'member checking' (Bryman 2012; Liamputtong 2009). The option for member checking was given to all of the participants as part of their informed consent (Appendix C). Member checking is designed to confirm with participants that their accounts are properly reflected in the findings. When none of the participants took up the initial offer, I

contacted three who were willing to be part of the checking process to ensure a measure of checking. One participant was from the Launceston study and two were from Hobart.

For the evidence and findings to be used to make some form of wider claim, beyond the confines of the research itself, the research needs be *transferable*. This term, by extension, refers to the ability to transfer the theoretical or analytical findings of the research, and the degree to which readers are able to transfer the research findings to their own settings. This research is made more transferable through a process of coding to build thematic interpretations which incorporate relevant theoretical concepts into the analysis (Mason 2002).

To ensure safe outcomes in the field, a risk assessment was carried out with, and approved by, the School occupational health and safety officer. The issue of de-identifying informants in the reporting of findings was addressed by adopting pseudonyms and by using only video sequences and images in which the participants' identity was obscured. The nature, though, of researching and filming in public settings poses a number of other methodological and ethical issues. In addition to the possible identification of the participant themselves, there was also a risk that third parties, pedestrians or drivers (the latter also by their vehicle number plates), might be identifiable in the footage.

In Australia, the *National Statement on Ethical Conduct in Human Research* (National Health and Medical Research Council 2007 – updated May 2015) makes no specific reference to video recording in the list of commonly used methods for collecting data (2007 – updated May 2015, 23). According to the two most relevant papers on the subject (Ludlow 2005; Miles 2012), the ethical issues of filming in public spaces in Australia are usually those associated with the proliferation of digital recording devices. The problem was the extent to which publicly recorded images or videos could be understood as harmful, and the chance that their circulation may become uncontrolled. For this research, people's faces and car number plates caught in the video footage was de-identified by using editing software capable of tracking and blurring such features. The research received ethics approval (approval number H42138) from the Human Research Ethics Committee of Tasmania as minimal risk research.

Cycling in Australian urban settings is potentially risky. Inserting myself into the frame of the participant's regular ride, and following along behind, might also have had unintended safety consequences. The risk assessment was used in identifying and mitigating any additional risks of the follow-along method. Part of the rationale for selecting the compact and readily mountable digital camera was to minimise any intrusion or distraction to the participant and to my research work. Following and filming also requires that the researcher follow the participant at a distance that avoids intruding into their riding space and sightlines. The consent form was completed by each participant before filming began (Appendix C). The methods and purpose of the research were outlined in an information sheet and supplied to participants (Appendix D).

Locations, settings, participants

Launceston and Hobart

The research settings were Launceston and Hobart, the two largest cities in the state of Tasmania, Australia. With a population of 100,000 in Greater Launceston (City of Launceston 2016) and 210,000 in Greater Hobart (City of Hobart 2016) these are comparatively small cities by Australian standards. Nevertheless, both cities have the forms and features of most cities in Australia, albeit on smaller scales (Figures 3.3, 3.4, below). Both Launceston and Hobart have geographically central city centres (otherwise known as central business districts or CBDs) and surrounding inner and then more outer residential suburbs. Neither Launceston nor Hobart has train or tram public transport, but they do have regular bus services. Their respective road systems radiate into and out of their CBDs. The major roads are busy during morning and afternoon peak hour travel. In Hobart in recent times there have been media reports of congestion (O'Connor 2016).

The maps below (Figures 3.3, 3.4) show the geographical features of landforms, water catchments and bodies of water which have helped shape the road system. Both cities are arranged around significant waterways: the Esk River flowing into the Tamar Estuary in Launceston, and the Derwent Estuary in Hobart. Both cities have relatively flat centres, located near these waterways. Most of the participants' journeys began in the suburbs as downhill runs in the mornings, and ended in the city centres, requiring an uphill climb in the evenings.

Without local knowledge it can be hard to judge whether the street-level video stills are of rides in Launceston or Hobart. At ground level, the cities' mixes of roads, traffic, and infrastructure (including bike lanes), as well as their topography and weather conditions, are similar. Beyond their Tasmanian location, both cities are also tied to Australian rules, conventions and norms. The road rule of driving on the left-hand side is readily apparent when watching the videos. The wearing of helmets by cyclists is also mandatory in all states and territories. When ridden on the road, the bicycle is legally classified as a 'vehicle', and must be ridden in conformity with the road rules, although allowances are made for bikes' relative smallness and lack of speed compared to motor cars. For example, bike riders can overtake to the left of a vehicle (with some exceptions) (Tasmanian Government 2016). Bike riding on footpaths is legal in Tasmania, as it is in Queensland, the Australian Capital Territory, the Northern Territory and, recently, South Australia (Australian Bicycle Council 2015). Cyclists must give way to pedestrians. Cycling is often prohibited in malls and on busy footpaths in the city centres.

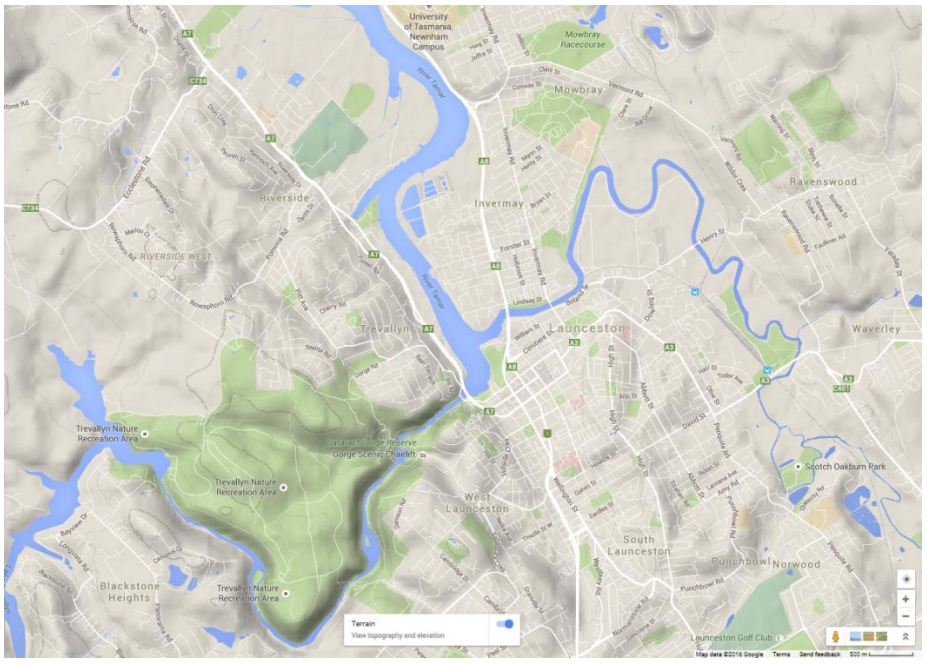

Figure 3.3 – Launceston, Tasmania (Google Maps 2016)

Figure 3.4 – Hobart, Tasmania (Google Maps 2016)

Participants, bikes, rides

A purposive sampling approach ensured that the sample was relevant to the research focus and included a range of locations, settings and participants (Bryman 2012). A total of eighteen participants were recruited, nine from Launceston and nine from Hobart. There were eight women and ten men. The age range is shown in Table 3.1, below. Table 3.2, below, gives a summary of the participants, their locations, their bikes and the rides that were filmed. Their names have been changed but their gender can be discerned in the choice of their pseudonym. A brief description of the type of bicycle (Table 3.2) and the co-agential qualities of their bicycle (Appendix E) is included. Participants could choose to be filmed using the follow-along method, or to self-video. Three participants elected to self-video.

The principal method of recruitment was by flyer (Appendix F) circulated in the newsletters of two community-based interest and advocacy groups: the Tamar Bicycle Users Group (Launceston), and the Hobart Bicycle Network. Six people made contact after hearing about the research from others already taking part. Flyers were also put on noticeboards at the University of Tasmania's city-based campus in Hunter Street, Hobart. This study is an in-depth exploration of cycling practices – the regular and routine *doing* of cycling. Over time, a regular cycling practice engenders capable and experienced cyclists. It was these people who were the focus of the recruitment process. Apart from the safety and ethical implications of

researching undeveloped cycling practices in streets and traffic, inexperienced cyclists without a routine practice were not the focus of this study. The participants who responded to the flyer were capable and experienced cyclists, riding three to five days a week. The sample included one informant who had a regular pattern of cycling, but who also self-identified as being capable though had only ridden in a city (Hobart) for less than two years. The heterogeneity of settings, participants and their rides was designed to ensure the reliability of the findings.

The fieldwork began in Launceston before shifting to Hobart. It was initially thought that a total of around twenty-two participants, distributed between Launceston and Hobart, was an appropriate sample size. As the fieldwork progressed it became increasingly apparent that eighteen was a suitable sample size given the range of ages, variety of rides in different conditions, and the gender balance. It was also apparent that data saturation (Liamputtong 2009) had been reached when the analysis was showing that no additional insights were being generated.

Choosing to ride a bike instead of traveling by car or bus is unusual in Tasmanian cities. Cars are the mainstay of Tasmanian travel choices. Estimates vary, but travel by bike rather than by car or bus accounts for about just one in every hundred trips in Tasmania (Australian Bureau of Statistics 2009). All of the participants rode their bikes regularly and had been riding for several years or longer. Most rides were to and from places of work or study. There were also instances of shopping, paying bills, travelling to a restaurant at night and to a café to catch up with friends. A variety of routes were ridden in differing seasons, weather, traffic and lighting conditions. The rides varied in duration from about ten minutes, to the longest one that lasted 36 minutes (from Launceston city centre to the hilly suburb of Blackstone Heights). Several rides were filmed as linked sequences. The camera was stopped while participants visited shops or post offices (typically), and was then started again with the ride underway. These videos can be as brief as several minutes.

Table 3.1 – The range of ages

Age (years)	Less than 26	26-35	36-45	46-55	56-65
Number of Participants	1	4	6	5	2

Table 3.2 – Participants, bicycles and rides

Participant Pseudonym (City)	**Bicycle** Refer Appendix E	**Ride(s)**	**Ride conditions and features**
Allie (Launceston)	Road bike (with pannier bags)	• City to home • City to outer suburbs for work • Linked sequences - city centre to home	The rides were self-videoed with a helmet-mounted camera. All were in fine conditions, though roads travelled were sometimes wet from overnight rain. The city to home ride was one of only two night-time trips recorded (and both were self-recorded).
Jesse (Launceston)	Road bike (with pannier bags)	• Home to work • Work to home	Three rides filmed through Launceston CBD. Camera noise becomes apparent on the first ride.
Steve (Launceston)	Road bike (with pannier bags & pedal clips)	• Business trip into the out of the CBD	Both rides were on an overcast day on initially wet but progressively drier roads.
Adele (Launceston)	Hybrid (with pannier bags)	• Work to home • Home to work	Two long rides from outer suburbs in the Launceston hills Ride home uphill was 36 minutes long, the longest recorded.
Cam (Launceston)	Racing bike	• Home to work • Work to home	Two fast downhill descents into work, and slower return. Cam used footpaths four times in ride.
Cate (Launceston)	Racing bike (with pedal clips)	• Home to work • Work to home	Fast descent from the suburban hills of Launceston, and a long, slow return into the glare of the afternoon sun.
Alice (Launceston)	Hybrid (with pedal clips)	• Home to work • Work to home	Descent from suburban Launceston hills to Launceston CBD, and return.
Andy (Launceston)	Hybrid (with pedal clips)	• Home to work	Morning commute across Launceston using the Unitrail and riding the Mowbray Connector desire line.
Phil (Hobart)	Road bike (with pedal clips)	• Work to home	Commute home, mostly along Sandy Bay Road.
Sarah (Hobart)	Hybrid (with pedal straps)	• Work to home • Home to work	Morning and evening commutes. Evening commute was on wet roads.
Pat (Hobart)	Road bike (with pedal clips)	• Work to home	A long commute home from the west side of Hobart to the 'eastern shore' via the Tasman Bridge.
Alistair (Hobart)	Road bike (with pedal clips)	• Work to home • Home to work	Commute, to and from Hobart CBD along Sandy Bay Road, were re-videoed with a helmet-cam in addition to the handlebar cam because of camera-shake.
Jack (Hobart)	Fixie/hybrid with pedal clips	• Work to home • Home to work	The rides were self-videoed with a helmet-mounted camera. The return home was filmed at night.
Amy (Hobart)	Dutch-style	• Video sequences to and from work	The sequences of rides to and from work were self-videoed with the camera handlebar-mounted.
Daniel (Hobart)	Road bike with pedal clips	• Work to home • Home to work	Short but traffic-busy commutes filmed into and out of Hobart CBD.
Mark (Launceston)	Hybrid with panniers	• Video sequences - home to the CBD	Filmed from home through the Launceston CBD with several business stops.
Erin (Hobart)	Hybrid	• Work to home • Home to work	Sequences filmed through Hobart suburbs and CBD. One sequence filmed in light rain.
Deb (Hobart)	Electric Dutch-style	• From home through the CBD for business	Five linked video sequences from home, through the Hobart CBD and back, filmed early in the afternoon; featured busy roads and footpaths.

Introducing the Findings

The findings are set out in the next four chapters. The first three are: Chapter 4: Moving moments, Chapter 5: Moving places, and Chapter 6: Journeying. Each chapter is made up of three themes which were generated using thematic analysis, both inductively out of the NVivo coding, and deductively from each chapter's interpretive framework – timing, spacing and acting, respectively (Table 3.3). Chapter 4 foregrounds the more temporal aspects of a ride; the moving figure of the bike-rider in time. Similar in approach, Chapter 5 foregrounds the more spatial encounters. Then, for Chapter 6, the focus becomes more on the combinations of timing, spacing and acting that make up everyday journeys. The last theme of Chapter 6, *making journeys: waymaking*, is used to synthesis the themes into the key concept of waymaking. Chapter 7, the last of the analytically-informed chapters, explores two key exemplars of waymaking.

Table 3.3 – Chapters and themes

Chapter	Themes
Ch 4 Moving moments *(timing)*	*In the moment* *Fused to the bike* *Riding lines*
Ch 5 Moving places *(spacing)*	*Infrastructure* *Mobile entities* *Shaking, rattling*
Ch 6 Journeying *(acting)*	*Reasoning, sensing* *Collaborating* *Making journeys: Waymaking*

The analytical development of each of the themes above is illustrated in multiple ways. The interview transcripts and the video footage are the primary sources for generating the rich descriptions of each theme. The participants' own words are also used, along with the storyboarding of their words and images. In two of the themes (*in the moment* and *collaborating*) extracts from the table of themes, codes and coding densities in Appendix B are included to show the analytical development of themes. In addition, six short video

sequences, each less than a minute long, are used to illustrate specific practices. There are two such sequences per chapter. The videos illustrate the analytical development of the themes and, just as the participants' own words illustrate their thoughts, the videos show their actions.

Chapter 4 Moving moments

The title of this Chapter, 'Moving moments', reflects the temporal moments of cycling. It is also deliberately ambiguous. Moving moments is the relationship of physical travel (moving) and affective response (being moved). The title speaks to the research process itself, and to the many moments in the video footage which stimulated reflection, insight and inquiry. The themes elaborated in this chapter illustrating the *doing* of cycling grew out of moment-to-moment movements, actions, and events in the video footage. While sitting and watching the rides with the participants there were moments in which nothing much seemed to be happening, and alternatively, other when many things were obviously going on. With the capacity of the video to elicit a sense of 'being there' and 'moving with' the bike-rider, it was usually the busier moments that drew the liveliest responses. But the quieter, more routine moments were also rewarding.

The first of three themes presented, *in the moment*, shows how dynamic moments and situations shift the way in which participants encounter their riding worlds. The theme was developed from the situations in the footage where participants talked of their sensory awareness of their riding environment becoming much more active. It was usually the busy and less predictable moments when this heightened form of awareness was experienced, but that was not always the case. The second theme, *fused to the bike*, is taken from a phrase used by a participant during the interviews. This theme grew out of quieter, less intense moments when not a lot seemed to be happening apart from the regular rhythms of riding. This 'fusion' of bike and rider – the co-agential entity of the bike-rider introduced in Chapter 3 – was found to be a contingent, moment-to-moment achievement integral to the practice of cycling. The theme explores how practices of balancing produce a stable, meshed mobile entity.

Ride lines are the traces that would be left by always-wet tyres on dry pavement. The third theme, *riding lines*, makes visible the navigational desires and logics of bike-riders, first by exploring on-road ride lines and then by moving off-road to a particular and visible ride line in Launceston. The theme highlights the *timing* as much as the readily apprehended *spacing* of cycling. The final short section titled 'Moving on' is a transition to the more spatially orientated themes of Chapter 5: Moving places.

Theme 1: In the moment

Active awareness

Filming urban cycling on-the-move is an unconventional method of researching cycling in Australia but this research was always intended to look for much more than conventional meaning. The theme of *in the moment* shows how the cyclists became more focussed and aware when negotiating their sometimes busy travel environments in Launceston and Hobart. They mentioned being aware of feeling uneasy in certain situations, when passing parked cars, for example. Conversely, they also remarked at other times of being aware of feeling comfortable and safe. The other form of awareness reported, though, was that of simply feeling *more* aware. This was active awareness – becoming more fully immersed moment to moment in the nature of the unfolding situation or potentially risky encounter. Active awareness was not particularly associated with either positive feelings (of, say, feeling safe or comfortable), or with negative feelings of unsafety or vulnerability.

When watching the videos and talking about how they went about their rides, participants often referred to differing types and intensities of sensory awareness. Three forms of awareness were revealed in the NVivo analysis of the interview transcripts: an awareness of feeling vulnerable; an awareness of feeling safe; and active awareness (Table 4.1). Active awareness was not particularly associated with feelings of vulnerability or of safety *per se*, and active awareness was by far the most frequently mentioned form of awareness.

Table 4.1 – Key coding sources for Theme 1: *In the moment*

Coding Category	Number of sources	Coding frequency
awareness of vulnerability, aversion, risk	14	77
awareness of feeling safe, comfortable	15	72
active awareness	16	164

Mark spoke of feeling vulnerable while waiting to make a right turn in the middle of two-way traffic flows: ‘This is where I feel most vulnerable, it’s when you move out into Brisbane Street, in that right-hand turn’. Just as often as they mentioned awareness of feeling vulnerable, participants talked about their awareness of feeling safe or at ease. Narrating a

downhill section of his ride, Steve said, 'I'm having a quick look down the road to make sure there're no pedestrians there, and feeling kind of good now'. The third form of awareness, while not so much awareness of feeling either good or vulnerable, was conveyed as *a feeling of awareness* rather than *an awareness of a feeling*. The participants spoke of feeling *more* actively aware of or in touch with their environment:

> Welcome to the environment! You're in the air, you're in the rain [if] it's raining (laughter). You're on the road if you slip. So I guess I feel more alive. If I drive I just feel [it's] stultifying. I'm stuck in a box and while it can be fun to zip around at 50 kilometres per hour in a nippy little car … [on my bike] the road's my own, you know. I just feel, on a bike, I'm so much more connected and alive (Deb).

While alluding to the risks of falling off and to the discomfort of cycling in the rain, overwhelmingly Deb was enthusiastic in describing feeling more aware, more connected and more alive. This sense of connectedness and awareness of the environment, of being in it (or even *on* it with a slip) was also apparent to Jesse. While we were watching the start of his ride, I remarked that the sky had looked 'really, really nice' during the ride. For Jesse, riding *in* the environment meant noticing more, being more aware. Figure 4.1 is a video still of that sky and Jesse riding 'in it'. My remarks have the darker blue background and Jesse's response the lighter blue.

Figure 4.1 – 'You're in it' (Jesse)

'Noticing more' or 'feeling connected with the riding environment' evokes an active awareness – a heightening or intensifying of participants' ability to sense the world. This was described many times, and in different terms. While watching the video with Daniel of him manoeuvring around parked cars and through moving traffic along Marieville Esplanade (a street along the Hobart foreshore, busy with cars, bikes, and pedestrians), he described his awareness as a form of focussed awareness:

> It's just 'okay, here's an attention point,' so I guess I am totally focused on that, but I'm not anxious in dealing with it. I'm dealing with it. I'm just being very aware (Daniel).

Focussed awareness on cars was, for Daniel, his practice of 'trying to read the body language of cars'. Deb similarly described being 'very aware of the behaviour of drivers. I'll pick up the moods of drivers'. Active awareness was required to maintain safety and to respond to threats, but it also did more than this – it offered the rider a heightened perception and sense of connectivity and aliveness.

For Sarah, bike riding:

> Makes you super acute about what's going on around you on the roads. I noticed that, even in the car now, I'm much more sort of aware, looking for danger (laughter), than I was before (Sarah).

For Mark, being more aware just came 'with the territory … you are relaxed but you're aware … I mean you just can't *not* concentrate' (Mark). These examples, coded to 'active awareness', demonstrate that being conscious of danger, and moreover, actively on the lookout for it, was not automatically associated with anxiety.

Recognising danger and risks engendered a measure of caution. Bike-riders were alert to developing patterns of risk. Sensing these risky situations prompted moments of becoming 'super acute', totally focussed, and of greater care:

> I don't go thrashing down here, [there's] a bit of peril at the bottom. There's a blind left turn there … So you go at a crawl pace (Cam).

Being careful did not necessarily mean slowing down. Daniel attended to the emerging patterns of danger on Marieville Esplanade by shifting his hands closer to the brakes, and by deliberately moving into the centre of the road to become more visible to oncoming cars. Being 'super acute', Allie could distinguish the type of car-driver approaching from behind by listening:

> There is an oomphy kind of noise to them. They've got that, that hoony sound. I mean normally, normally they back off the accelerator a bit, don't they, when they're being good … you can hear them thinking. If I think they are going out around me, that's fine, [otherwise] you check over your shoulder (Allie).[7]

Becoming more actively aware was, in essence, becoming more sensate. For Allie, becoming more acutely tuned to her riding environment meant listening intently for patterns of car noise but also 'looking, a lot'. For Sarah, too, it was 'listening a lot … because you rely so much on your hearing'. For Sarah, being alert to risk was a state in which 'your peripheral vision, and the sound, of course, it really gets all your senses working … and I think that's probably part of the buzz of it'. Deb's sense of exhilaration, reported earlier, and Sarah's 'buzz' lingered on in the conversation space.

[7] 'Hoon' is a colloquialism for a loud or reckless driver.

None of the participants listened to music on their rides. Talking about why she decided to forgo headphones, Amy voiced what was left unsaid by most other participants but was demonstrated in their bike-riding:

> I sort of make a decision not to, because [though] I listen to music constantly when I walk, I really feel like I need to hear stuff and that's important, because moments and stuff are so fleeting and passing when you ride at certain points that I want to … I want my senses to engage properly with everything (Amy).

'Engaging properly with everything' went beyond actively looking and listening for cars. It pushed into every aspect of the immediate environment, including surfaces:

> Being aware of the holes and the things that, yeah, I guess that's what you look for, too, because there are aspects ... whether it's loose gravel, [all] kinds of considerations I guess (Amy).

Cycling cultivated not just awareness of surface conditions but of the physicality of riding different terrain:

> You're much more conscious of terrain, riding a bike. I can remember when I first started commuting from my home to Deloraine, thinking 'I don't remember there being a hill here – where did that come from?' (Steve).

Allie described the connectedness between walking in her local nature reserve and cycling:

> That's where I guess I sort of feel that in the way I walk around, and also bring this into my biking, is that kind of difference, a sense of really looking and being a part of the environment in some way, and responding to the environment, rather than 'I'm in a vehicle, this is a mechanical thing, this object to get me from here to here, and I have to sit within these parameters' (Allie).

An awareness of the moving bicycle was very often implied but hardly ever mentioned. One occasion was Steve talking about his awareness of the instability of bike riding, though it was promoted by comparisons with riding motorcycles: 'You definitely have to watch it when you get back on a pushbike [after being on a motorbike] because they feel much twitchier'. Linking cycling awareness to seeing and hearing cars, traffic and busy situations was common, but linking awareness to bike instability was not. A key aspect of overcoming

riding instability is balancing, but balance brings other senses to the fore, not just seeing and hearing. Though rarely mentioned, balance is explored in *fused to the bike*.

Being actively aware was not always needed and not always welcomed. Amy described the changing focus of her awareness, 'depending on your speed, depending on the location … you don't engage as much'. Allie looked for moments when she could relax her focus on traffic to pay more attention to passing the gardens of suburban homes: 'I'm not so keen on that hyper-state that I want to be in it all the time'.

The participants' skill and experience was in recognising situations that needed greater attention. According to Daniel, it was often impossible to see where a driver's head, and, by implication their focus of attention, was directed due to the reflection of the glass:

> So you're really reading the body language of the car, the acceleration and the angle and you can tell if a driver is het up and hasty from the way they enter an intersection. If they are too relaxed and then you think, 'Oh, they're not going to see me maybe'. Whereas if they are hasty then you know that they might suddenly do something (Daniel).

Daniel's skill and experience in reading the unfolding capriciousness of a situation through the body language of cars was similar to Allie's *hearing* the oomphy 'sound language' of cars discussed above.

Being mindful of the moment

Steve linked managing the unpredictably of bike riding to a state of becoming mindful of the moment:

> Being present in the moment; mindfulness. I like the mindfulness of cycling because you need to concentrate, because you are balancing and you can't just vague off and go 'what am I going to do later on, I've got to get this from the shops'. You need to be in the moment to be safe. I like that because, you know, we live in a very distracted world. So cycling keeps me mindful of the journey, in the way my body feels, so I'm very present (Steve).

Even riding on quiet sections of bike paths away from the busyness of traffic, some level of awareness was needed to maintain stability. For Steve, it was an integral and satisfying part of bike riding.

Amy narrated a sequence she filmed on a wide footpath to explain how she rode through busy places. The people there were adults and children: sitting; standing; talking; walking; and playing. The video shows the speed and proximity of each passing manoeuvre. While Amy appears to be riding fast and passing close, the people appearing and disappearing in the wide-angle frame barely seem to register her bike-riding presence, and much less appear unsettled.

[Video 1 – Hunter Street]

Each passing manoeuvre is deftly performed, showing skill and focus. The affordances of Amy's Dutch-style bike helped – 'because it's more upright … I just kind of weave around people very easily' (See also Appendix E for Dutch-style bikes). Storyboarding the short sequence is another way of representing Amy's Hunter Street footpath encounters. Showing both the video and the storyboard demonstrates the two different methods of interpreting the same sequence (Figure 4.2, below, reading top to bottom, left to right).

Figure 4.2 – Being mindful and reading situations (Amy) (Self-videoed, handlebar-mounted camera)

For Amy, there was the body language of people and their patterns of movement to be visualised. Amy also talks about approaching the ride intuitively, introducing the idea of a puzzle. Rather than just a pattern (to be read), the idea of a puzzle (to be solved) implies a more open, contingent riding environment than one that is set and structured. Negotiating busy, less predictable spaces activated awareness and mindfulness of the moment. Elsewhere Amy had talked about awareness and unpredictability:

> This awareness … you're working with things around you, in one second something else can happen. It's the shift of where you sit in relation to things. I guess that aspect of mindfulness comes back in (Amy).

Becoming actively aware, mindful of the moment, was, as Amy relates, a shift in the bike-rider's relation to events. Dynamic situations shifted how bike-riders encountered their worlds. Rather than feeling anxious or overly vulnerable, there was a shift in their relationship with the contingency of bike riding. Being in the moment, being mindful and actively aware of what was taking place allowed uncertainly to be negotiated as a routine lived practice in the sense of Stratford's (2015) ideas of *dwelling-in-motion*.

What emerges from these accounts is a strong sense of the sensory and mental acuity intrinsic to bike riding. Deb talked enthusiastically about being connected to the environment which for Jesse was riding in the environment. Sarah, too, talked about the 'buzz' of cycling and getting all her senses working. Being actively aware was being open to and mindfully absorbed in the moment. The experiential process of becoming more mindfully aware was not only a necessity of bike riding; at times it was a deeply rewarding element of the practice. Though bike-riders *did* sometimes feel vulnerable and at other times comfortable or safe, more often they had a sense of simply being more attuned to the moment-to-moment unfolding of their ride.

The theme of *in the moment* shows that when participants negotiated busy places such as shopping precincts and intersections, they became very focussed on the minutia of their timings and spacings. Rather than dwelling on what has just passed from view, or anticipating what might lie around the next corner, they became actively aware of what was taking place from moment to moment. They sought to actively compose and contain their cycling to the immediacy and intensity of situations by being in the moment.

Other studies have reported that everyday cycling is loaded with sensory affect. Spinney has likened it to journeying in a 'place of sense' (2006, 709). For Jones, 'commuter cycling makes intense demands on the affective capacity of its participants', and is at times beyond the 'affective capacity' of inexperienced cyclists (2012, 655). While agreeing with Jones' contention that those promoting and planning for cycling need to be aware of situations that are likely to make demands on affective capacities, for example, cycling close to car traffic, there is a need to be careful with overly negative portrayals. There is an understandable impulse to associate sensory intensities with the extremes of the chills (or thrills) of cycling (Jones 2005; 2012). At times the participants did intensify their sensory awareness but mostly by being more aware rather than being 'chilled' or 'thrilled'. Put simply, it was a matter of

becoming more mindful. While not using the term ‘mindful’ as such, Spinney highlights through his research the way cyclists can blot out distractions by becoming intensely aware of the details necessary to enacting their safe passage:

> The social space of the high street in Streatham, so full of people, interactions and visual signs when experienced visually from the confines of the bus, becomes irrelevant when experienced from the bike as the rider’s attention becomes focused solely on what is important to negotiating the space (Spinney 2007, 34).

In a similar vein, research into off-road mountain bikers (and walkers) has shown that, for the mountain bikers, the more rugged and demanding the terrain, the more mindful they became. The language used by study participants is not dissimilar from that of this study. For example, they talked of gaining ‘instant headspace’, and of ‘crowding out all the [day-to-day] stuff that is doing your head in’ (Brown 2016, 3). The participants became immersed in negotiating technically demanding terrain where roots, rocks and ‘gnarly’ bits loomed as very material crash risks. The more risky the terrain, the more their ‘profound feelings of escape and respite’ (2016, 3) were enhanced.

According to Brown, the demands of textured, even rugged surfaces are a short-cut to ‘distil and intensify somatic engagement and *literally en-force a shift in consciousness from mind to body*’ (2016, 3, emphasis added). Interestingly, Brown makes no connection being made to ‘mindfulness’ as such. Just as riding mountain trails is rewarding and pleasurable, the present research highlights that busy, even demanding situations can also be accompanied by a rewarding and pleasurable ‘buzz’ when the cyclist becomes immersed in the unfolding, moment to moment demands of producing (safe) rides.

Active awareness and cycling risks

The hazards routinely faced in the everydayness of cycling in Launceston and Hobart appeared in the footage and in the participants’ accompanying narratives. These narratives were filled with references to ‘being aware of this line of parked cars’ or ‘looking out for that approaching car’. The videos showed these moment-to-moment fluctuations in patterns of cycling risk. In this more-than-instrumental study of cycling practice, risky situations were usually accompanied by accounts of being more actively, even acutely aware. Another side of cycling risk was reported in Chapter 2: epidemiological research has shown that over the

long-term, the health benefits of regular cycling lower the risks of diabetes, obesity, and heart disease, and that this more than outweighs the risks associated with cycling crashes (Bassett et al. 2008; Pucher and Buehler 2010 Pucher et al. 2010). That is, long-term benefits outweigh short-term risk. Still, perceptions of cycling safety and risk remain a major barrier to people taking up cycling (Garrard 2003; Garrard et al. 2008).

Whether these findings are considered as intensifying sensory awareness, being in the moment, or mindfulness, they still hinge on ideas of risk and safety. In the public discourse, cycling is depicted as inherently dangerous (Aldred 2013; Garrard et al. 2010; Horton 2007). Concerns about safety are often cited as a significant barrier to cycling uptake (Chatterjee et al. 2013; Daley and Rissel 2011; Pearce 1998; Ryley 2004). Horton (2006) argues that the fear of cycling is inadvertently reproduced through one of the very measures intended to overcome it – the safety campaign. Concern, even fear of the risks of cycling is regularly portrayed as a major emotional barrier to cycling, yet how regular cyclists deal with risk on a daily basis, or even from one moment to the next, has not been sufficiently analysed. Studies overwhelming problematise risk, concluding that the key to reducing risk and improving uptake lies in better and more cycling infrastructures, both on road and off. The answer is not necessarily so simple, as the National Cycling Strategy, discussed in Chapter 1, demonstrates. Certainly, better and safer infrastructure is warranted, but what this theme highlights is the notion that becoming mindfully in the moment adds something more than the usual studies have addressed in their simplistic conclusions that risk reduction will inevitably follow the construction of more infrastructures. The question is: can a more-than-instrumental account of active awareness open up new possibilities for perhaps knowing and doing cycling more safely?

The idea that, in the routine busyness, and even riskiness, of everyday cycling, intensities of awareness might be linked to mindfulness is potentially productive. According to Lea et al., mindfulness is widely researched in psychology, but the ‘practice of mindfulness in its everyday context’ deserves more attention from social scientists and geographers (2015, 53). Lea et al.’s argument highlights the crossover of bike riding habits of awareness with everyday practices of mindfulness, but this crossover is often problematically tied to contexts perceived strictly as hazardous, risky and dangerous. In making sense of how cyclists went about their encounters with risky contexts, another understanding of flow, originally developed in studying peak performance and ‘peak flow’ in sport, is explored below.

What is unusual in these findings is their recognition that within cycling habits can be found practices of mindfulness. The word ‘mindfulness’ is usually associated with beneficial forms of quiet meditation that work to overcome the tendency to go about everyday routines on ‘automatic pilot’. According to Lea et al., mindful practices ‘cultivate a way of staying within and increasing awareness of the “present moment”’ (2015, 53). This form of meditation also focusses on adopting ‘an attitude of non-judgment towards this [current] experience’ (2015, 53). Like mindfulness meditation, the practice of intensifying awareness also ‘attends to the immediacy of contexts in which mindfulness is being practised, whatever those contexts might contain’ (2015, 61). At times, situations and events did heighten participants’ feelings of unease. Much more often, however, the participants’ practice was to become increasingly immersed in the immediacy of unfolding events and encounters without judgment. Like the research into mountain biking through rugged terrain or commuting through crowded streets, this research shows that the coping strategy of immersion in the moment reframes the hazards and risks of everyday cycling in unexpected ways.

Uncertainty and risk pose vexed questions for cycling researchers. While trialling the video-camera in Launceston, I happened upon the aftermath of a major cycling crash. The circumstances, however, did not line up with the usual portrayals of vulnerability, risk and safe cycling infrastructure in the literature. The crash was a head-on collision between two commuting cyclists. One cyclist received minor injuries; the other’s condition was much more serious. The grainy image in Figure 4.3 shows the scene about an hour after the event, with the ambulances gone and the police investigating. The crash took place on the unitrail bike path (the unitrail is discussed in depth in the theme of *riding lines*), a major commuter route to the local university campus, segregated from car traffic and designated just for cyclist and walkers. The complete separation of bike paths such as the unitrail is held to be something of a ‘holy grail’ for trouble-free cycling (Aldred and Crosweller 2015; Pucher and Buehler 2010). This crash event is a reminder that bike paths, too, hold the risk of disruptive and hazardous risk. What emerged from this study is a picture of cyclists encountering and negotiating risk in ways that are different from the usual perceptions and portrayals of risk.

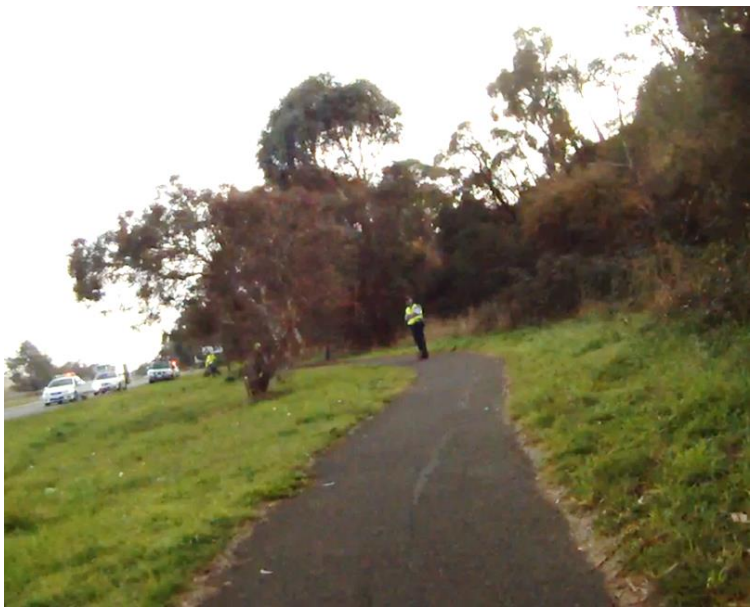

Figure 4.3 – The unitrail crash scene (Author-videoed, handlebar-mounted camera)

Theme 2: Fused to the bike

This theme developed out of the close-coupled relationship of the bike and rider, and the stability that relationship engenders. *Fused to the bike* explores a progression of ideas, beginning with balance. Bike riding balance is the stability of the bike and rider, achieved largely through a combination of forward momentum, weight distribution and steering.[8] Balance, or ride stability, relies on many small, quick, unconscious adjustments to speed, weight distribution and steering.[9] Balance and stability also relies on the meshing of the bike and rider – becoming one with, or fused to, the bike – as one participant described it. This notion of riding stability is extended to the tactics of riding smoothly and predictably in Theme 3: Riding lines, where being smooth and being predictable, and being seen to be so by car drivers, were key habits used in dealing with traffic. Finally, Theme 2 returns to concepts of fluidity and flow, but this time linked to effort and effortlessness.

[8] There are other factors (such as bike geometry) which are not included here (Wilson 2004).

[9] Being quick and unconscious, these adjustments are often hard to self-observe (Wilson 2004).

Meshing the bike-rider

In the following short quotation from Cate, ride balance is not mentioned but is nonetheless the key to achieving two of her three movements:

> There I was, heading for the gutter, but I realigned myself. I'm back in the seat there, because it's easier to... Now, I can give my legs a rest. It was quite windy coming home on this particular ride, so I found I was bracing myself, just so I wouldn't get blown, because, being lighter, sometimes I get blown around a bit on the bike (Cate).

The video segment shows Cate shifting her weight, tilting the bike and steering into a new trajectory. In fact, other than at very low speeds, 'steering' a bike is largely achieved by momentarily shifting the centre of balance and leaning into the turn.[10] In other words, the bike-rider:

1. Shifts slightly out of balance;
2. Tilts into the new trajectory; and then
3. Realigns and restabilises.

When Cate braced herself, she was stabilising her centre of balance against sudden and unpredictable shifts.

Balancing is a fundamental component of the practice of cycling. Forward momentum is attained by balancing, and balancing enables forward movement. Staying upright, as opposed to falling off, is a product of the meshing of the bike's geometry and the rider's comportment, along with forward momentum.[11] In a sense, all bike-rider comportments are configured around balancing; maintaining the centre of gravity within acceptable limits of stability, and maintaining forward momentum. Staying balanced is a skilled if tacit or taken-for-granted, aspect of bike riding knowledge. With most of the interview time taken up by talking about the more observable happenings in the footage, balance and balancing were hardly mentioned, apart from responses to the occasional specific question.

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[10] At these faster speeds, the sequence is actually initiated by momentarily steering the front wheel slightly *away* from the turning direction (Wilson, 2004).

[11] With the right amount of rolling speed, a bicycle becomes self-stabilised. Bicycle geometry contributes to steering and balance, but forward motion is needed, too, and the physics of this interaction is not fully understood (Wilson, 2004).

One occasion when balance did come up was Jesse's account of 'track standing'. Track standing, or staying upright while seemingly stopped, is a skilled practice. Jesse used track standing as 'a personal challenge' waiting at traffic lights (Figure 4.4). He placed himself in the traffic queue, rather than 'dodging up the sides' (Jesse). Tracking standing is a momentary 'suspension' of cycling momentum. It poises the rider ready to take-off speedily without impeding car traffic. Jesse's momentary track stand is the only time in all the participant footage where the act of balancing is so clearly visible.

Figure 4.4 – Track standing (Jesse)

Practices of balancing were very often implicit in discussions about other riding practices. Narrating his difficulties in signalling a right hand turn at roundabouts, Daniel mentioned the competing demands – signalling, braking and, implicitly, balancing:

> Now, here you're caught between slowing and having to keep your hands on the brakes and watching for the traffic, but then that means you can't give those cars a turning signal (Daniel).

As bikes slow down they become increasing unstable. Taking a hand off the handle bars to signal increases that risk of becoming 'wobbly'. Almost all of the Launceston participants and many from Hobart had downhill runs from home to their destinations. As for Dan, the competing demands of signalling and balancing were problematic for Allie, and were one of the few instances when balance was mentioned:

> Okay, I don't, to tell you the truth, I don't always indicate ... Because when I'm going to work, it's downhill and to take my hands off the handle bars, I'm likely to upset my balance (Allie).

The stability of bike riding was also found to be close-coupled with the conditions of the road surface. Wet roads, bumps, potholes and gravel were commonly pointed out, but mostly in passing. The risks of losing tyre traction, losing stability and falling off were always implied but hardly mentioned explicitly. For Mark, talking about a section of just-completed roadwork in Launceston, the potential instability of riding on gravel was assumed:

> There's one little spot where they haven't got the transition quite right. There's gravel or loose metal, the path here has just broken up terribly. They had it really nice but there's a lot of loose gravel now. New people [cyclists] aren't really confident on this; it's nerve-racking (Mark).

On the road, balancing the bike-rider was seen to be a fine-tuned, even graceful accomplishment. Balancing is a highly-embodied practice, an almost invariably seamless achievement, barely needing to register consciously. The desk-bound research task of analysing and representing balance and balancing is a more difficult. The range of words describing balance is small and is often reduced to being 'balanced' or being 'unbalanced'.

There is a contradiction in writing about balance or imbalance, stability or instability. Serres (2000) uses the example of a spinning top to explain that stability and instability co-exist. According to Serres, the spinning top is neither stable nor unstable; the top hovers between stability and instability in a state of metastability (Serres 2000). Like the spinning top, the cycling bike and rider are understood to exist in this contingent state, always needing to actively produce and reproduce the stability of their rides. Nonetheless maintaining balance is a succession of highly embodied comportments and movements throughout a journey to ensure the bike and rider remained meshed. This meshing of bike and rider is explored in the two instances where it became most apparent: when two of the participants talked about learning to ride a different type of bike, and when one participant recalled her recent efforts to re-learn to ride.

Two participants talked about learning to ride 'fixies' – single speed, fixed-gear bicycles.[12] For Steve, recalling his recent experience of learning to ride a fixie instilled a sense of needing to monitor how he was adapting to different riding sensations 'on the bike, and with the momentum, and how you're meshing with it'. Jack's new fixie was lighter, narrower and without the cushioning suspension of his mountain bike. It had pedal clips for securing his feet to the pedals, a feature Jack had not experienced before. His fixie felt more agile and responsive compared to his mountain bike. The pedal clips accentuated the feeling of being coupled with the bike. Consider Figure 4.5, below. The image is from Jack's helmet-mounted camera with bike and rider at rest just before beginning the commute into work.

Figure 4.5 – The fused bike-rider (Jack) (Self-videoed, helmet-mounted camera)

People learning or relearning to ride as adults have insights into the process of becoming a bike-rider. The awkwardness of trying to mesh the pedalling, steering, braking and balancing can, in a moment, come together. For the experienced rider, the tacit knowledge of bike riding is hard to unpack. Learning experiences can provide important glimpses. Recalling her experience of relearning to ride a few years before, Amy spoke about her initial feelings of dissociation and confusion in contrast to the stability and fusion she now experiences:

[12] One participant, Jack, rode a fixie and self-videoed his ride. The other, Steve, rode his 'normal' bike for the filmed sessions but shared his experiences of riding fixies in the interviews.

> [When I started] I really felt like the bike was moving me and I just happen to be a prop on it. Whereas now it is different, you know I just, the bike is almost that part of my body in the way I move it and bend it, to mould it, depending on the situation (Amy).

The participants were quick to point out the array of things and forces working to destabilise that fusion. The fused bike-rider is a provisional entity forever at risk of degrees of instability.

Stabilising the bike and rider

Thinking through the mostly taken-for-granted nature of a balanced and stabilised bike and rider (if such a state is attainable) is a precursor to establishing how the tactics of cycling smoothly and predictably maintain that stability. While balance encompasses both stability and instability, small-scale imbalance or instability can quickly turn into large-scale instability. Balance is fundamental to cycling. Maintaining balance can be very simply understood as 'not falling off'. The difficulties of learning to ride a bike are largely overcome once children (or teenagers or adults) learn to balance. Learning to ride a bike is a significant achievement for children (McDonald 2012), and their balancing skills quickly become innate (Wilson 2004). Balancing is a key and ongoing achievement in stabilising the practice of cycling. Balancing, though, was hardly talked about in the interviews, with more direct questions eliciting little further detail. The one observed instance of track-standing (the stationary balancing at traffic lights) seemed to offer a promising entry point for probing balance, but again produced little. Part of the problem is that balance is such an innate and seamless skill in everyday life that it is hard to represent verbally:

> We effortlessly recognise sensations that seem to arise from within the body during activities like dancing or riding a rollercoaster, but one difficulty lies in communicating these bodily feelings and haptic sensations. Language is lacking, terms desert us, and such instantly recognisable experiences become barely articulated, or articulated barely (Paterson 2009, 766).

There are very few words in our vocabulary that describe balance directly. Balance appears to be a matter of being 'in balance' (the usual act of cycling), or degrees of being 'out of balance' (from being off-balance through to falling over). The videos rather than the interviews held the key to unlocking cycling balance, along with the ideas of stability, smoothness and flow. In a similar way, Brown and Spinney found video particularly useful

for ‘getting at feelings of flow which we found to be important to both off-road and urban cycling’ (2010, 137).

Cycling can be considered to be a co-production configured by movement – the metastable fusing of body and bike with and through movement. Like the active achievement of balancing, for the experienced participants, feeling fused to the bike was very much taken-for-granted. However, instances of learning or relearning cycling skills are informative. One participant recalled her recent experience in relearning to cycle and the profound sense of *coming to feel at one* with the bike. For two participants, feeling at one with their bike was underlined when learning the new skills of riding specialist bikes. For Jack, this became apparent in his use of pedal-clips as a type of prosthetic extension of his body. Thrift writes:

> [I]t could be argued that the human body is what it is because of its unparalleled ability to co-evolve with things, taking them in and adding them to different parts of the biological body to produce something which, if we could but see it, would resemble a constantly evolving distribution of different hybrids with different reaches (Thrift 2008, 10).

The pedal-clips endowed Jack with the pleasurable sense of feeling at one with the bike, or being *fused to the bike.*

It became evident through the findings that there are many ways to destabilise the bike and rider. Close encounters with encroaching traffic, gritty edges, slippery surfaces and potholed roads in the videos were underlined by the experiences of the participants. The feeling of being fused, or at one, with the bike could change in a moment. Similarly, Michael’s (2004) hybrid unit of the co(a)gent is portrayed as a source of both stability and instability:

> Insofar as the heterogeneous relations entered into between humans and nonhumans enable new hybrid units of analysis (comprising combinations of humans and nonhumans) to be formulated, these can be used to illuminate social episodes still further. On this perspective, nonhumans and humans operate together to produce both order and disorder (Michael 2004, 6).

There was much at stake for the cyclist in maintaining their balance and stability throughout the journey. Nonetheless, as an everyday and ordinary achievement, there were times when mere ‘stability’ transitioned to something recognisable as more fluid and flowing.

Maintaining the flow

Participants used the words ‘moving’, ‘momentum’ and ‘effort’ when describing their bike riding. These ideas were often linked together:

> And [I'm] optimising my momentum and my effort. I don't want to have to stop at lights and lose momentum. I'd much prefer to keep moving … So generally, this is the best route for me. You avoid traffic lights and you keep your momentum. You don't have to stop and start. You don't have to change gears (Cam).

When I questioned Cate on what she might have been thinking about as we waited at a red light, she, too, responded about having to stop: ‘Yeah ... Gritting my teeth (laughter), having to stop, yeah’. Her usual strategy had not worked: ‘To go a bit slower to try and stay on the bike as long as I can, so I don't actually have to stop at the intersection’ (Cate).

For Jesse, too, maintaining flow was important: ‘Yeah, it is about maintaining flow. When I’m riding home I like as little stopping as possible’. There was often more at stake than just disliking having to stop and then start. Speed and momentum enable options. Without speed bike-riders can be vulnerable:

> Yeah, yeah, so if someone does get in my way I can turn, I’m much more nimble if I’m still moving than if I’m stopped. And now I’m adjusting my speed because I see cars coming down the hill, and I don’t want [to] have to stop, because I hate having to stop right there because you’re really vulnerable because there’s cars from lots of different directions (Steve).

Going up hills was part of the journey home for many participants. Riding uphill takes effort and many of the Launceston-based participants had significant hills to climb. Nonetheless, Allie was philosophical about her riding home. The uphill slowed her down, allowed her thoughts to wander with less of the immediacy and exhilaration of riding downhill:

> You get into a rhythm and your thoughts wander and you just, you kind of enjoy it even, as much as it is possible. It is a very different enjoyment than going downhill. Obviously going downhill is cruisy and fun and exhilarating, but going up the hill is a very different headspace. Like a metaphor for life. Uphills are a part of the journey (Allie).

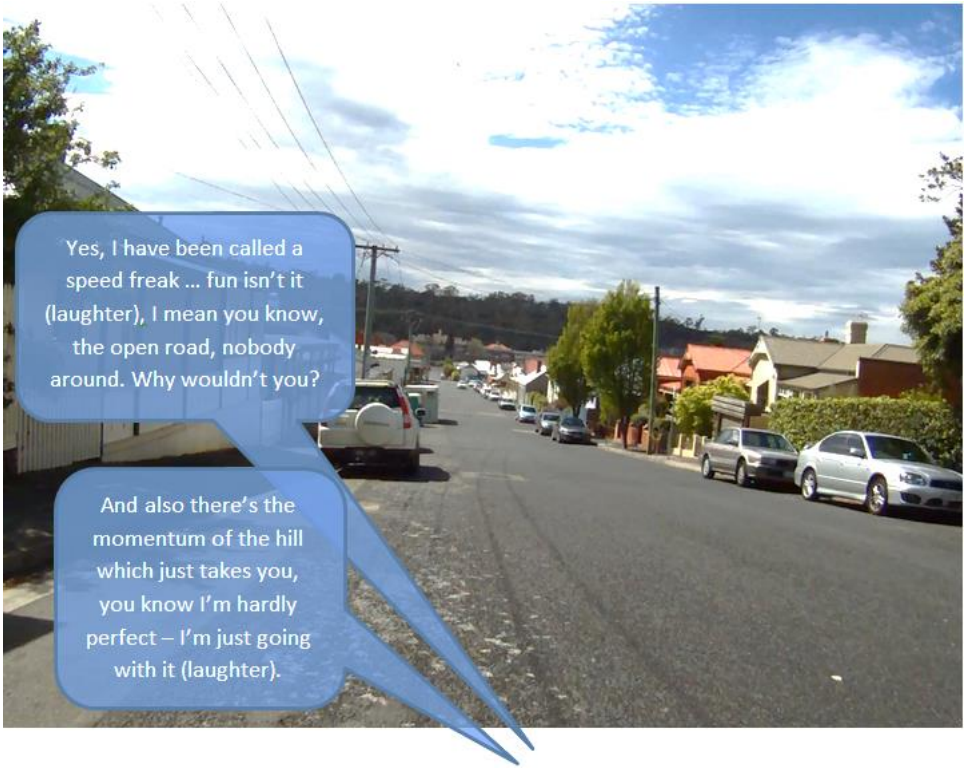

Figure 4.6 – Maintaining the flow (Amy) (Self-videoed, handlebar-mounted camera)

Freewheeling or coasting down even small inclines was often portrayed as exhilarating. For Amy it meant just going with the flow (Figure 4.5). Whether it was described as a feeling of flow or as being at one with the bike in the immediacy of the ride, these moments often appeared in less trafficked spaces. As with Amy's traffic-calm street, a quieter part of Pat's ride went through a smooth, wide arc next to a park. Figure 4.7 is a still from Pat's ride through Cornelian Bay, Hobart. It was a clear, still summer evening. Pat is monitoring how he is meshing with his bike ('I'm just enjoying it') and his riding rhythms ('how am I spinning'?) while building up speed for the hill. Pat is conscious of the engaging views but it is his meshing of cycling movements with the flow of cycling momentum that fills his attention.

Figure 4.7 – How am I spinning? (Pat)

There were different interpretations but the experiences reported in the findings of this thesis are very similar to Nakamura and Csikszentmihalyi's outline of the characteristics of flow:

> Intense and focused concentration on what one is doing in the present moment … [m]erging of action and awareness … [a] sense that one can control one's actions; that is, a sense that one can in principle deal with the situation because one knows how to respond to whatever happens next (2002, 90).

The emphasis in flow research has been on 'the phenomenology of person-environment interactions' (Nakamura and Csikszentmihalyi 2002, 90). Ford and Brown's (2006) study of the experience of surfing showed similar characteristics of flow and peak experience, but these experiences were often associated with 'exotic' locations and ideal surfing conditions. For this research, the reports of being in the moment were borne out of everyday encounters with busy and potentially risky situations. However, where participants did use an analogy of

'flow' it was often said to be 'going' with the flow, and was associated, for example, with coasting downhill, or with experiences of smoothness.

Theme 3: Riding lines

For all but one of the participants, this research project was their first opportunity to see video footage of their bike riding. The visual record appeared to accord with their expectations, as no-one was surprised at how they rode. While it was not always said, as such, they all appeared reassured by what they saw. For those filmed by the follow-along method, what was also important, and tied to feeling reassured, was their bike-riding appearance to other road users. They relied on tactics of cycling smoothly and predictably around parked cars or in and out of traffic. Being smooth and predictable was talked about by participants and is discernible in the footage. It was this perspective of the following video camera (that of the camera-bike-researcher), showing how they might appear to drivers approaching and passing from behind, that they were most interested in.

Smooth and predictable

The participants were highly conscious of their on-road visibility. They perused the footage, checking on their lights, clothing, high visibility gear, and backpacks. Several participants decided that they might get brighter rear lights, but most were reassured by their level of visibility. What reassured the participants most of all, though, was *how* they rode, their overall riding style:

> It was pretty much how [I thought] I looked. I looked smoother on the video than I imagined myself. My desire is to look smooth and take a predictable line, and I was kind of happy with how smooth and predictable I looked, so that was good. I was happy with that, I was happy that I didn't see anything problems in the video (Steve).

> I like the look of the way I ride. I'm very aware of what's going on and I'm very careful to acknowledge other road users and I don't sort of wiggle around a lot … something I consciously do to be efficient. You know, trying to keep your hips still (Erin).

Being smooth and predictable were important elements of their cycling practice. Cycling often happened over sustained periods in close proximity to faster-flowing traffic. There were times too when the bike rider transitioned in and out of traffic flows because, for example, the

road narrowed or lines of parked cars were encountered. Predictability, rather than visibility, was at issue here. Participants donned their high visibility gear and made sure their lights worked before starting the ride. Through their long-term on-road experience they felt sufficiently visible, and the video footage reassured them. If they had considered their visibility to be an issue at all during the rides, they would not have ridden in the confident, assured manner they did. Moving safely and being seen to move safely was of the essence here.

Being smooth and predictable allowed car-drivers to gauge and adjust speeds and lines to accommodate cyclists. Situations and individual riding styles varied, so there were different ways of being smooth and predictable. Phil preferred to hold a line, a trajectory, just out of the traffic flow:

> So that there's not this sudden dart of action and a motorist [suddenly] sees me coming. 'Where did that cyclist come from?' I'm already there. Even here, I'm not right in the gutter … But I don't... I mean, a lot of people I would describe as being gutter hogs, they'll try and cycle right in the gutter. I'd like to try and pick a line and hold that line, and not weave in and out, and have a sensible position where I'm not riding in the grit and broken dirt, and not having to swing out around cars too much. So, I like to try to have a consistent line so that I behave predictably (Phil).

Allie used a different approach to achieve the same aim:

> Oh yeah, the aim is to be smooth, but I'm prepared to stop if I have to. If I'm not happy, if I'm not confident the car is … if it is coming too fast, the gaps too small, then I'll just stop, and just wait there. Just wait patiently until there is a decent gap to get around the car. So the idea is to be smooth but I am prepared to stop, whereas, it does worry me; some riders are more assertive, assuming that everything will go their way. I just like to have a back-up plan (Allie).

The way participants portrayed their riding style and the way they appeared in the footage were very similar. From the follow-along perspective, changing proximities were negotiated smoothly and predictably. Jack's perspective was different again. 'Flow' was a term he used repeatedly when talking about travelling along Sandy Bay Road around parked cars and other obstacles. Initially, it appeared to be about simply staying outside the flow of car traffic:

> I guess I could describe that in terms of flow. To me that's what the push and pull is. If you try to stay out of their [car-drivers] way, things flow better, but it's at your expense, you're exposing yourself more, you're facing more danger, more risk [from stationary objects at the roadside], but things go better, cars go, you go, everything flows, but if something happens, it's basically you get into an accident … The other way to do it is, to be in their way, to be... say, to ride in the middle of the road, [to] do those things that actually break the flow of traffic. And that just may make everything slow down, it makes everything slower. Cars don't go as fast, it's a bit annoying for you; pedestrians, people have to wait, you become a nuisance, but you're a lot safer … So, I find that's a difficult dilemma. It's either you do what you can to make things flow, but if something happened, you know it's going to be bad news for you. Or you accept being a pain, but you know that you're on the safer side. And I think it's a really hard thing to resolve and in my opinion, you can't resolve it unless you actually change the way you organise the road, you build [bike] lanes or whatever (Jack).

Here, smoothness and predictability, or flow, are being conveyed as a mutual achievement of both cars and bikes. The aim is a *smooth* and *predictable* flow of bike riding to help a smooth and predictable *flow* of car driving. In this context, bike and car flows are mutually constituted. Smoothing one helps smooth the other, upsetting one upsets the other. Flow was a powerful metaphor. It was described in experiences and made visible in practices.

Fluidity and flow

Metaphors of fluidity are helpful in considering how bikes and cars exhibited different forms of fluidity and flow. In their seminal paper, Mol and Law (1994) use the metaphor of blood circulating in the body to argue that 'social space behaves like a fluid' (1994, 643). Fluid spaces offer a different reading of how the mobility processes of everyday road traffic operate. There are the more homogenous, fixed and stabilising spaces of urban road systems, such as traffic lanes, bike lanes, footpaths, white lines and gutters. But for cyclists these can be liminal and porous spaces. The slower but often fluid spaces of cycling were different from those of car driving. Mol and Law's concepts of fluid spaces are useful:

> For there are social objects which exist in, draw upon and recursively form fluid spaces that are defined by liquid continuity. Sometimes fluid spaces perform sharp boundaries. But sometimes they do not – though one object gives way to another. So there are

> mixtures and gradients … In fluid spaces there are often, perhaps usually, no clear boundaries (Mol and Law 1994, 659).

Mixtures and gradients, and clear and unclear boundaries help in decoding the differing on-road mobilities of bikes and cars. Very often, cycling and car driving practices were on roads with no 'sharp' boundaries for cycling, such as bike lanes. In such spaces, cyclists relied on smoothness and predictability to minimise turbulence and instabilities. On roads, cycling was most often performed at the margins, giving way to mainstream flows. On footpaths – spaces designed for people – cycling was again performed smoothly and predictably to flow around the slower moving spaces of pedestrians.

When cyclists felt squeezed by traffic flows, they sought respite by moving to the road's margins. Sometimes they went beyond, using the spaces of driveways to seamlessly gain the sanctuary of the footpath. These were highly effective responses to the affective discomforts of encroaching traffic. There is a repertoire of skills people deploy to negotiate their cities, and the highly fluid spaces of cycling afforded unique capacities by allowing individual cyclists to 'find a means to move, like water, sliding between the cracks of space that mysteriously open up once some unseen pressure is applied to the crowd' (Butcher 2014, 465).

Alternatively, when approaching intersections or cycling around parked cars, cyclists could become quite assertive by claiming a lane in the traffic for themselves. This was done by being smooth and predictable, by signalling, and often by leaving the road-margins well before the intersection. Being unable to match the speed of cars, the timing and spacing of bike riding moves was critical. While the 'boundaries', 'gradients' and 'mixtures' analogies of Mol and Law are useful for thinking about aspects of cycling stability, there were also instances of turbulent instability (explored further in the two waymaking exemplars). Turbulence can be thought of as arising out of the frictions of encountering the city. Turbulence is erratic and unpredictable, holding possibilities of both productive new formations, and disruptive, dissipative events (Cresswell and Martin 2012; Prigogine and Stengers 1984).

Riding lines

The participants regularly used the terms ‘my ride line’ or just ‘my line’ when describing their rides. Ride lines were implicit in all manner of descriptions, as Alice’s words, for example, demonstrate:

> So, weaving in and out from the side is challenging. So I try and make a decision whether I'm going to be out there (laugh) or closer to the footpath, because if you go around the parked cars, you run the danger of the people coming out of the parked cars, they're not going to see you. So, yeah, it's a judgment call in terms of whether there's people in those cars and whether you're going to get wiped out by a door or not. Other than that, I'm just looking out for hazards on the side of the road that I'd prefer to avoid. So, that's how I pick my lines (Alice).

Bike riding was as much about judging and riding ‘good’ lines as avoiding ‘bad’ ones:

> Yes. Yeah, I am, looking for good lines on the road and further down Tamar Street, there are some bits that I try and avoid as well (Alice).

Ride lines described bike riding at the spatial scale of streets and the temporal scale of moments. It was what was happening in the here and now and, moments later, just down the road. The process of picking lines was an ongoing string of judging and negotiating in space *and* time. Trajectories between fixed and moving things were constantly opening up and closing off. As such, choosing good lines and avoiding bad ones, was a timing-spacing skill:

> Those manhole covers, it’s smoother to ride right over the middle of them than to go around on the side of them. So, you know, I just go right over the middle. Again it depends on traffic. If I can't see any traffic behind me in my rear view mirror then often I'll just, I might ride out a little bit further (Andy).

Achieving ‘nice’ lines was found to be intrinsically rewarding, as Amy reported:

> And then this bit, I actually go through the under-pass here, which is always another fun thing, moving around these tight corners and stuff like that – getting to adjust your speed. You get used to how much you can… Going around here there is the possibility that there will be people, so you’re always mindful of how, you know, to then navigate through that (Amy).

In the same breath, Amy talks of the spacing of tight corners and the timing of adjusting speeds. Riding was a constant interplay with road surfaces and their infrastructure, too. Metal inspection covers, or manhole covers, are ubiquitous features of Tasmanian (and Australian) urban road systems. The larger covers (Deb is seen skirting one in Figure 5.13) were avoided altogether or ridden on the midline:

> Ah, yes a metal one [inspection cover] and concrete one. Yeah, so a concrete centre with metal frame. So I've seen that and thought 'midline', so I don't get caught on the edge. And I've probably taken the weight off the saddle as well so I can let the bike absorb the bump (Steve).

The constant search for the good lines while avoiding bad lines was summed up as, 'yes and guiding the front wheel towards the smooth bits and avoiding the potholes … so negotiation, like a mountain biker, I suppose' (Deb). Ride lines were tied to rider speeds but also to traffic:

> There were dry and wet sections on the road, so that altered the way I ride, especially down Westbury Road on the high-speed section, which is the only place I was worried about traction and grip … I was deciding whether I would ride where I normally ride, which was wet, or slightly further into the road, where it was dry [but also] depending on how I thought I was travelling, speed-wise, in relation to the other traffic. So if I thought I was going at about the same speed as the rest of the traffic, I chose the dry line, and for corners particularly (Adele).

In one sense, ride lines are an expression of the innate, utilitarian desire of people to take shortcuts (Cresswell 2012b; Furnham 2012; Tiessen 2007). Pedestrians and cyclists are said to be 'natural Pythagoreans, preferring the hypotenuse to the other two sides of the triangle wherever possible' (Adams 2004, in Spinney 2010, 122). Spinney, in his study of urban cycling, points to countless examples of participants seeking to conserve their 'energy-space' by taking the shortest, and, where possible, flattest routes. At times, the participants also sought to conserve their energy-space by moving through the city with 'a slow, continuous' rhythm, needing less energy than a 'stop-start rhythm' (2011, 124). Participants optimised their mobility often using quite utilitarian logic: considering the mix of distances and gradients, as well as the frictions along the route, such as traffic volumes and traffic lights. It would seem that more-than-instrumental desires are invariably entangled with utilitarian

motivations. This understanding resonates with the conceptual setup of mobilities as the entangled dimensions of movement (or transport), meaning and practice introduced in Chapter 1.

As bike riding produces ride lines, car driving produces drive lines. Drive lines were apparent in videos filmed along Sandy Bay Road in Hobart. Passing cars travelling in the same direction were very often seen to travel wide to avoid cyclists, even when cyclists were in wide sections of the Sandy Bay Road bike lanes. As bike-riders tended to keep to the left, car-drivers could be seen keeping to the right, sometimes passing over the central dividing lines on the main road. Figure 4.8 shows a series of cars passing Phil on Sandy Bay Road.

Figure 4.8 – Overtaking symmetries, Sandy Bay Road (Phil)

Other than perhaps the quickly disappearing lines of wet tyres on roads, ride lines leave no trace. There was, however, one exception: a visible line worn from repeated bike-riders cutting across the busy Mowbray Connector in Launceston. Figure 4.9 (reading top to bottom, left to right) shows Andy's crossing. The storyboard is composed from a 20 second video segment of the crossing of the two busy lanes and a median strip divider of the Mowbray Connector.

[Video 2 – Crossing the Mowbray Connector]

The Connector joins the urban grid of Launceston to the fast-moving traffic flows of the East Tamar Highway. The line is used to shortcut a section of the ‘unitrail’; a popular bike path between the city centre and the local university campus. The sequence begins on the unitrail approaching the start of the ride line. A choice of ways looms. The ride line, distinctly visible, peels off to the left. Bollards and white lines mark the formal route of the unitrail as it transitions back to the road system.

Figure 4.9 – Riding a diverging line (Andy)

The ride line cuts about 700 metres and a crossing at traffic lights from the journey, saving about two or three minutes. While the crossing entails negotiating intermittent streams of fast-moving traffic, the sightlines are good. The space of the median strip allows time for choosing where and when to make the second crossing. By preserving forward momentum where possible, by not having to stop altogether, each lane crossing can take just two or three seconds. Andy (with me closely following his cues) worked constantly at adjusting and smoothing his line and speed throughout the crossing. The line disappears on the road, but also in the width of median strip as bike-riders fan out to follow individual desires and choices. These are no less smooth through time and space, but leave no perceptible trace. It is this perception of the twofold nature of the line, the plainly visible, smooth-curving trajectories leaving and returning to the unitrail, and the absence-presence of the line on the asphalt and median strip that is important.

But what of cyclists' riding lines, their lines of desire ridden on the 'inscription-resistant paved surfaces so ubiquitous in urban settings' upon which 'their ride lines are undetectable' (Tiessen 2007, np)? Throughout the video footage, cyclists can be seen performing their riding lines in a variety of ways and scales across their ride but without leaving any discernible trace. There was the more macro-scale manifestation of the semi-stable route of the ride, with cyclists usually following the same street-to-street route. There was also the readily apparent 'meso-scale' patterning, appearing as cyclists moved through streets as they transitioned in and out of flows of car traffic, for example, or negotiated their way around parked cars. At a smaller scale again, there were subtle riding rhythms weaving back and forth as cyclists instinctively sought out desirable riding surfaces. Each smaller and larger loop traced a negotiation of resistances and opportunities in space and time. What emerged in the findings were riding line traces with a weave and flow much like the Connector desire line.

Across multiple urban scales, a cyclist's lines of desire were continually shaped by the immediacy of the forces, encounters and interactions of their urban waymaking. One particular set of forces and interactions unique to the co-agential cyclists shaping their riding lines is the inherent need to stay upright – to stay in balance. Balancing is a dynamic achievement full of rhythms and interactions, forever shifting bike and rider back and forth

across their 'intended' line. The mobilities of bike riders are inherently looping and curving in character. It would seem that bike riders cannot ride straight lines, no matter how hard they try (Wilson 2004).

Daniel's following description of the ride lines generated in his morning peak-hour crossing of busy Sandy Bay Road in Hobart reads like Adele's nuanced description of ride lines on Westbury Road as lines of best fit in space *and* time. Daniel's words also resonate with the timing and spacing of Andy's Mowbray Connector crossing:

> So, the pattern is, deal with the traffic on the side of the road, I don't try to deal with both sides at once, so I deal with one side, get to the halfway point and then it's whatever. The thing that you always want to avoid is coming to a complete stop and unclipping. So, all decisions are made in order to avoid that. So you can look at the traffic without having to turn your head at too big an angle, positioning the bike and your whole trajectory so that you can be watching the threat of cars by basically looking forward. Also, if you get off [stop and unclip] of course your acceleration powers have gone, and so you're very much in a weaker situation (Daniel).

I questioned Daniel further asking, 'so, is this the idea of maintaining your momentum where you can?' Daniel's reply is shown in Figure 4.10. The still was taken from the first half of the crossing and shows him taking advantage of a lull in the oncoming traffic to angle across the road (with me following along) thus maintaining his momentum through to the relative sanctuary of the median strip. His slightly unconventional line also avoided any entanglements with the more conventional ride line of another rider crossing moments before and just out of picture to the right. Daniel introduces the imagery of crafting spline curves in describing how he goes about creating his ride lines.[13]

[13] Splines or spline curves are thought to have originated in the wooden shipbuilding industry, where long strips of timber were used to help model hull designs to establish smooth flow lines; that is, hulls with lines of least resistance to flow.

Figure 4.10 – Fitting a smooth spline (Daniel)

Splines or spline curves are thought to have originated in the wooden shipbuilding industry where long strips of wood were used to craft ships' hulls, developing shapes with smooth, flowing lines that offered the least resistance to flow. Spline fitting, or spline shaping, can be thought of as shaping and smoothing curves of best fit to minimise operating turbulence by generating smooth, laminar lines of flow. Like crafting a hull to establish smooth, flowing lines, cyclists fashioned their smaller and larger curves and loops in smoothing the timing and spacings of their ride lines.

There is blurring between the ideas of flow explored in *fused to the bike* and the manifestation of smoothing time *and* space apparent in ride lines. Ride lines are produced from the bike-rider's desire to smooth the geometries of urban places *and* the timing of their encounter by maintaining, where possible, their momentum. That is, the desire to maintain their flow by riding smooth lines in space, and smooth, flowing speeds in time. Flow was also manifested as a desire to be smooth and predictable, to flow alongside faster traffic flows at lower speeds without conflict. Flow was tied too to a meshing of bike and rider – the bike-rider – with the occasional added kick of exuberance on a downhill run or perhaps through the wide curving arc of an open road. Flow appeared to arise out of the skilled interplay between bike, rider and milieu to smooth the asperities of time and space.

In his research into the meaning and practices of everyday urban cycling, Spinney (2011) relates how one of his participants talked about feelings of flow and going with the flow. The participant's practices of riding a smooth ride line and (smoothly) maintaining balance and momentum are described as ways of maintaining his flow. Spinney's instance differs from Ford and Brown's, and it appears to be more aligned with the present study. Research into cycling practices is embryonic, and common understandings are yet to coalesce. This research, then, is cautious about making claims linking themes of *in the moment* or *riding lines* with differing interpretations of flow. What *riding lines* 'intensities of awareness' unambiguously highlights is the overlapping similarities between practices honed in everyday streets, practices of calm mindfulness, and notions of flow developed out of studying optimal experience.

Moving on

Thematic analysis of the temporality of cycling practice generated three key findings. First, cycling practice cultivates and expresses a mode of active awareness that places the practitioner firmly *in the moment.* Active awareness was very often linked to the busyness of riding in traffic, and was evident as an acute consciousness of the immediacy of the here and now of cycling. Second, cycling practice cultivates and expresses a state of *fusion to the bike* that brings the co-agential form of the bike-rider into sharper focus. The experienced participants demonstrated the ongoing practices needed in stabilising their rides. This was explored using the mostly taken-for-granted achievement of balancing. Becoming fused – becoming the bike-rider – led to moments when participants reported the exhilarating reward of maintaining the flow. The final theme used the transience of *riding lines*, and an informal but more permanent highway-crossing short-cut, to consider ways in which cycling practices work at smoothing time and space. The temporal orientation of this chapter shifts to a spatially orientated analysis of cycling practices in the next chapter: Moving places.

Chapter 5 Moving places

This chapter complements the predominantly temporal focus of Chapter 4, with a predominantly spatial interest in how the on-the-move bike-rider moves through and experiences urban places and spaces. It shows the way cyclists encounter their riding environment; the dynamic spatial relationship of cycling within roads, infrastructure and traffic. In the videos, the infrastructure of roads, road surfaces, centre islands, line markings and so on are seen moving in and out of view. Mobile entities such as cars, pedestrians and other cyclists are seen, too – each on-the-move and moving with differing speeds and agendas. The busyness of road settings, the urban topography, and the 'atmospherics' of wind and sky are other discernible features of the bike-rider's daily route found in the videos and transcripts. The first two themes, *infrastructure* and *mobile entities*, emerged from these encounters. The third theme, *shaking, rattling* features the riding surfaces of roads and footpaths. The theme begins with the problematic fieldwork issues imposed by camera noise, as introduced in Chapter 3. Rather than dismissing or attempting to ignore this as nuisance noise, a novel approach was adopted that sought to 'recover' noise as a finding by using NVivo-based images charting audio activity with the subtle, felt experiences of bike riding over changing surfaces.

Theme 1: Infrastructure

In the first half of this section, the urban infrastructure forms of intersections, bike lanes and parking places and spaces, which are key sites for bike riders, are examined. The second half explores the seemingly mundane features of road surfaces. Participants' everyday encounters with riding surfaces, however, proved to be surprisingly rich. Every participant commented on road surfaces, often repeatedly and with passion.

Intersections, bike lanes, parking places

During their ride, each participant passed though many intersections. Intersections came in different forms, from small suburban intersections, to those of major roads. Often, participants talked about specific features or recollections of intersections – this lane or that kerb; this near miss or that incident. Even minor suburban intersections could become places of drama and meaning for some participants. Pat talked about a collision with a car several

years before at an unremarkable suburban intersection we passed though. The intersection in question is wide and visibility is good. As Pat described it:

> I'm actually in the midst of the turn, and this dude tries to overtake me and just hits me … I ended up on the ground. The bike was fine so I rode home after it. But yeah just a little old man – 'oh sorry I didn't see you'. Like, what! You were overtaking me for starters, of course you saw me (Pat).

For Alistair, a car emerging out of a minor side road as he travelled on Sandy Bay Road became the place of his 'worst' crash. Traffic entering Sandy Bay Road from that road *should* give way:

> So, I was coming along here, and she sort of coasted into the intersection there, and I was about where I am now. And as I saw her coming further and further into Sandy Bay Road, I just gradually tried to ease out away from her, and in the end, she got me in the middle of that lane (Alistair).

Whether the intersection was informally arranged and without signs (Pat's example) or more formally arranged with signs (Alistair's intersection has 'give way' signs), intersections were places where smooth interchanges were not guaranteed. While no participant directly connected intersections with increased safety risks, intersections were discussed repeatedly and at length (intersections were the sites of much of the *collaborating* theme of Chapter 6).

Negotiating roundabouts was problematic for cyclists. I followed Sally through six 'minor' suburban roundabouts. Sally began by shifting her ride line into the centre of the lane, effectively blocking cars from trying to overtake as she approached. She signalled early. Each move was smooth and precise:

> I've had a friend who got hit in an intersection and then soon after that I heard of somebody else who got hit in a roundabout situation. I should say I'm very cautious (Sally).

Sally's purposeful approach to roundabouts was echoed by Jesse; 'I always take the centre line on roundabouts so that people can't pass me, because … the two times I've been knocked off have been on roundabouts (Jesse). Jesse continued: 'Cars are not used to looking out for bikes'. Besides not noticing cyclists, drivers could misjudge their speeds and intentions. Right turning around a roundabout was found to be one of the most difficult bike riding

manoeuvres. As the earlier findings on balance showed activities of signalling-turning-balancing, while watching traffic and maintaining momentum, are difficult to coordinate and sustain. When Steve negotiated a roundabout in Launceston, he recalled that there was ‘a bit of stuff going on there’. Figure 5.1 (reading top to bottom, left to right) shows how Steve’s practices of nimbleness, speed, prioritising and watchfulness combine to carry him smoothly through the unfolding situation.

Figure 5.1 – Negotiating roundabouts (Steve)

It is interesting to note Steve's response to my comment about lifting himself out of the saddle. Typically bike-riders were much less aware of their bodily comportments than they were of the activities of looking and listening. Watching these videos, then, caused the participants to become more aware of their tacit skills and responses. Steve's reflection, too, on perhaps going through 'a bit quick' also implies that involvement in this kind of research has the potential to be a learning experience for participants.

The very last still of Figure 5.1 shows Steve about to enter a bike lane. At some stage in about two thirds of the 55 rides (roughly half in Launceston and half in Hobart) some form of on-road bike lane was encountered. For Deb, moving into a bike lane was, 'fantastic isn't it! … I'm feeling much more relaxed'. That particular bike lane had a desirable combination of being wider than normal bike lanes, having a double white traffic-separation line on the right, a white parking-separation line on the left, and textured, green surfaces for better tyre grip (the lane in question is featured in Figure 6.5). In general, however, participants preferred having the relative sanctuary afforded by the presence of even the most rudimentary of bike lanes rather than no bike lane at all.

The bike lanes in the study were very often short and discontinuous. This lack of continuity was disconcerting to many participants. If riding *in* the bike lane was said to be 'relaxing', merging back *into* flows of car traffic was problematic. Typically, bike lanes end a short distance from intersections. For bike-riders the combined action of merging while approaching an intersection was doubly difficult. Some participants argued that it was better to exit well before the lane ended: 'I moved out well and truly before the end of that lane' (Mark). This manoeuvrer was referred to as 'claiming the lane' or, occasionally, as 'becoming a car'. Video footage shows this to be an assertive but smoothly executed tactic.

At the end of each of the thirteen commutes into places of work, every bike ended up under cover. Five were parked in under-cover car-parks, two in corners set aside for bikes. The rest were walked or carried into office buildings and stored in offices or spaces temporarily appropriated for bike parking. Cate's workplace provides a wide foyer with around ten bike racks. Alice took advantage of unused space in the corner of her office foyer to store her bike. Two bikes were stored under cover close to workplace entrances, one was stored in a shed set aside just for bikes. All thirteen storage places were close to, or actually in, places of work. Participants liked the security of having their bike close to their work space and out of the

weather. Two participants routinely carried their bikes up flights of stairs to their parking places – a case of the bike-rider becoming the bike-carrier (Figure 5.2).

Figure 5.2 – The bike-rider becomes the bike-carrier

Mobility studies are often misconstrued as valourising mobility and movement by emphasising the dynamics of the journey between origins and destinations rather than the routine aspects of departure and arrival (Hannam et al. 2006; Sheller and Urry 2006). Waymaking has beginnings and endings, co-productions taking place in the origins and destinations of the journeys. The findings underline the importance of considering the ends and beginnings of journeys as integral to the whole journey. For cyclists, how and where their bikes were parked was important, and an integral part of waymaking.

Most of the videos begin with bike and rider ready to go; in driveways, front yards, carparks or the streets outside homes and places of work. Participants were waiting, having wheeled their bikes out of garages, front doors, from workplace racks or storage places. Further, when arriving at workplaces, filming continued in order to find out where and how bikes were stored, parked and 'rested'. Several rides, too, were a series of interconnected stops and starts to shops or other places of business. Whether at work for the day or resting outside a post office for ten minutes, parking and securing bikes was a co-production configured in seemingly diverse ways but, in fact, with strong threads of commonality.

Where participants parked is intriguing; how they went about it is instructive. Bike parking was found to be largely about convenience and informality. Being able to go door-to-door

was said to be part of the convenience and charm of bike riding. Indeed, in re-watching the footage, it is quite disarming the way cyclists adapted space and used objects to secure their bikes, appropriating space and enrolling whatever was to hand. But behind actions, it is practices that are informative. Mostly unsaid, but clearly demonstrated, was the desire to lock bikes in secure places out of the weather. Parking inside places of work was ideal. For two participants, their access route to their office space was restricted to stairways, yet both unhesitatingly picked up and carried their bikes up these flights of stairs and into buildings – an intriguing reassembling of the bike-rider entity.

Car parking in central Hobart and Launceston is formalised by metered on-road parking spaces and centralised multistorey carparks. Bike parking is largely informal, the objective being to get as close as possible to destinations. Parking close to the entrances of destinations was said to be more secure because of the 'passive surveillance' of bikes by passers-by. Bikes were positioned to avoid disrupting pedestrian movements. In whatever way space was appropriated, bike riders sought out places that were out of the weather with good passive surveillance and nearness to their destination.

At times, in seeking security, convenience and accessibility, participants actually overlooked formal bike parking. In an interesting critique of newly built bike parking facilities at two railway stations south of Adelaide (South Australia), Bell and Ferretti (2015) show that a fence beside a carpark was a safer and more convenient parking alternative. Even in the more cycling-friendly cities of Copenhagen and Amsterdam, the practice of informally appropriating places and infrastructure for bike parking was found to be widespread, due in part to the large number of bikes and the lack of formal facilities (Larsen 2015). For Aldred and Jungnickel, bike parking in London is caught between being in-place and being out-of-place, with parked bikes being 'perceived as threatened or threatening, risky or at-risk; affected by theft, vandalism, the weather, official and familial disapproval' (2013, 609). Again, and most likely due to the upsurge in cycling in central London, and the accompanying use of informal bike parks, public perceptions have shifted to viewing these bikes as being in the way, or, as Aldred and Jungnickel put it, as 'matter out of place' (2013, 604). Nonetheless, with far fewer bikes and seemingly less public disapproval of informal parking in public spaces, cyclists in Launceston and Hobart were at pains to orientate and fit their bikes 'into place' as best they could.

Riding surfaces

Riding surfaces mattered to participants. Participants were quick to point out sections of road harbouring bumps, cracks and potholes, which were nonetheless often hard to detect from the footage itself, even when the video playback was slowed or paused. Consider the case of Jesse, the first participant I filmed. In the first of two interviews, Jesse talked about the prospect of returning home later that day along a different route:

> The other thing is there is a horrendously bumpy patch of road there. Tonight, if I ride back via High Street, you will discover it … it's an appalling piece of road (Jesse).

'Horrendous' and 'appalling' describe strong, visceral responses.

Fitzroy Place in Hobart runs between two very busy roads and was used by two participants. Being flat, aesthetically pleasing and relatively traffic-free, Fitzroy Place appealed to bike-riders. The road surface, however, is patchy and uneven. These discontinuities become visible and more hazardous when it rains (Figure 5.3). Sarah would have much preferred a ride line away from the 'door zone' of parked cars but she needed to avoid the edge lines of poor repairs. She reluctantly stayed closer to the parked cars. I faced the same dilemma. Like Sarah, I avoided the repairs but my ride line was nearer to passing traffic than I would have preferred.

Figure 5.3 – A really uncomfortable road (Sarah)

Viewing the video footage allowed participants to witness their manoeuvring to avoid poor surfaces and seek out smooth ones. Watching with Mark, I pointed out his practice of skirting around metal covers:

> Well, I don't even notice the manhole covers, I guess I'm doing that instinctively [skirting around]. Oh yes, and there's another one (Mark).

Riding over metal covers can hold more than just the momentary discomfort of a jolt or two. Metal surfaces become slippery and even treacherous when wet. Cyclists preferred to ride straight over the centre of covers if there was no way to avoid them.

One of the strengths of mobile video ethnography is the way it allows people to revisit their everyday travel and see, in all its routines, the *doing* of it. Three more examples show how, upon viewing the footage, bike-riders became more consciously aware of the potential perils they routinely and reflexively avoided. All three happened to be on downhill runs. The comments vary but the tone is consistent. The pothole that Cate avoids because of the jolt not feeling 'very nice' (Figure 5.4), Cam's 'nasty little bump' (Figure 5.5), and Pat's journey through a 'rough as guts' section (Figure 5.6) evoked the 'felt' recollections of potholes, bumps and dips.

Figure 5.4 – Avoiding dips (Cate)

Figure 5.5 – That bump (Cam)

Figure 5.6 – Rough as guts (Pat)

Cate's comment about the lack of shock absorption on her road bike as compared to her mountain bike recalls Jack's earlier comment about the rigidity of his fixie compared to his mountain bike (Figure 4.5). Jack also pointed out how the thinner, higher pressure tyres of his fixie affected his ride:

> They've got a higher pressure as well. So, I really feel every little thing in the road, every little bump and hole … but when it's smooth, it's a real pleasure to be riding this new one (Jack).

I queried Jack about 'feeling' the road and he went on to explain:

> The texture of the road, you feel that a lot more. Whereas with my old bike, the mountain bike, the tyres were much wider and they would absorb a lot more of the shocks, so you didn't actually feel it. It felt more, in a way more comfortable, more sort of like a couch thing. It's just like … I don't know … easier, safer, more stable, but also quite … there's a lot of friction. It's just riding [effort] all the time on the old bike (Jack).

Jack's sensory awareness of the textures of his riding surfaces was amplified by riding his more rigid fixie. While rough roads could be horrendous, and even perilous, smooth roads could be sources of real pleasure:

> It's a really good surface here, too, it's really nice and smooth, and that's my favourite part. And then it stops and becomes a bit rough again (Jack).

Deb talked enthusiastically about the interplay between ride lines and road surfaces:

> It's fun because you're controlling a vehicle. I guess there's the success of negotiating a bump, the joy of the totally smooth tarmac. Yes, and guiding the front wheel towards the smooth bits and avoiding the potholes. So negotiation, like a mountain biker, I suppose (Deb).

Traffic-slowing speed humps on roads were avoided by threading ride lines through the hump-free confines of gutters. It was unusual for participants not to do so. As Mark said, 'it's just easier. Not as bumpy'. Deb talked about using a gutter to skirt a speed hump as 'taking the little side bits'. She continued: 'So that's fun, yeah. Succeeding at challenges, I suppose'. Speed humps slow traffic. Picking lines through narrow but smooth spaces, hemmed in by the gutter walls but evading the speed humps, was rewarding.

The process of negotiating ride lines around rough road using gutters is shown by returning to Jack and his fixie once again. Figure 5.7 shows another image taken with his helmet-mounted camera, this time on the move on Sandy Bay Road, Hobart, a busy but generally free-flowing road popular with cycling commuters. Jack's video was shot mid-morning on a weekday. The video shows the traffic passing smoothly through quite fast. Jack has just ridden up a slight hill, so his speed has dropped. He has already encountered a patch of poorly repaired road – 'a really deadly one' – and is approaching another. He is checking over his shoulder (his helmet cam flicks back repeatedly) wanting to move farther out but wary of the faster-flowing car traffic. Drivers cocooned inside their cars might see his dilemma as 'just a little thing', but he faced risks either way. Jack's video shows him skirting the 'deadly' section by momentarily riding in the gutter.

Figure 5.7 – People just don't realise (Jack) (Self-videoed, helmet-mounted camera)

Every morning, Cam negotiates a strip of repairs across the downhill end of his road by singling out a narrow, smooth section. This positions him closer to oncoming traffic but, traffic permitting, this small manoeuvre is a permanent fixture of his ride. The repairs are part of the nationwide installation of fibre-optic cabling for the National Broadband Network (NBN). There was gravel left over after the installation and Cam intervened:

> There was a lot of gravel, and I went down with my broom (laughter) into the street and swept it all up … they left a bit of a mess, blue metal all over the place. So that's all sorted now (Cam).

Until repaired, poor road surfaces are fixtures of place. They become known, and routinely avoided, by bike-riders. Road gravel is also problematic. From one ride to the next, gravel can appear and then be progressively swept aside by passing traffic, accumulating at the road edges where cycling routinely takes place. Two participants talked about the problems of gravel when road surfaces begin to break up. Phil linked the presence of 'lots of loose gravel' with sub-standard road repairs; 'a cheap reseal'.

Labelling riding surfaces as 'rough' or 'smooth' could be limiting. It was a mix of surface and bike-riding factors which shaped the encounter. For example, faster speeds on downhill sections could magnify the roughness and hence the risks for bike-riders. While bumps might

be a nuisance in dry weather, they might be problematic in wet weather. Wet roads can change conditions, reducing surface friction and grip by degrees. Adele talked about wet roads and 'having the back wheel lose traction and spin out a bit'. She had, however, learnt how to 'sort of steady it and not get freaked out'. There are degrees of roughness, from small bumps, which were hardly noticed, to far more jarring and potentially hazardous potholes. Patchy road repairs could become a more or less permanent hazard for bike riders. The NBN trenching and repairing left indelibly marked surfaces across Launceston. An NBN repair is just visible in the bottom right hand corner of Figure 5.4, which, for Cate, was impossible to avoid. On the other hand, good repairs fixed issues, sometimes in unexpected ways. Cam pointed out one section of his ride where 'the footpath is actually better here as a result of the NBN, now we got a nice strip of black bitumen'.

There are varying degrees of smoothness. For Mark, the simple pleasure of riding was tied to surface smoothness:

> Again, this is fun, more fun than driving to work, you know, whizzing down a nice smooth street because they just resurfaced it (Mark).

Overly smooth surfaces did not necessarily suit bike-riding. Ice can be hazardous *because* of its smoothness. Considering black ice an extreme form of smoothness adds another dimension to thinking about roughness and smoothness, and how cyclists experience road surfaces. Adele talked about an unnerving encounter with black ice:

> The front wheel just went sideways. And it was just like standing on an ice-skating rink. There was nothing to regain control with. There was no traction, anyway. It was just *srrroom* (Adele).

For the bike-rider, the peril and pleasure of their riding surfaces was found to be much more sensory and experientially important than I had thought it would be. The challenge was getting beyond descriptions of roughness and smoothness. In ways similar to discussing ideas of balance, it was often the absence of details, the pauses, the questions left unanswered, that were telling. For example, Phil made a passing comment about a lichen-covered surface in a quiet street on his route home. Being my ninth participant, I was more attuned, by that time, to talk of riding surfaces, so we talked a little more (Figure 5.8).

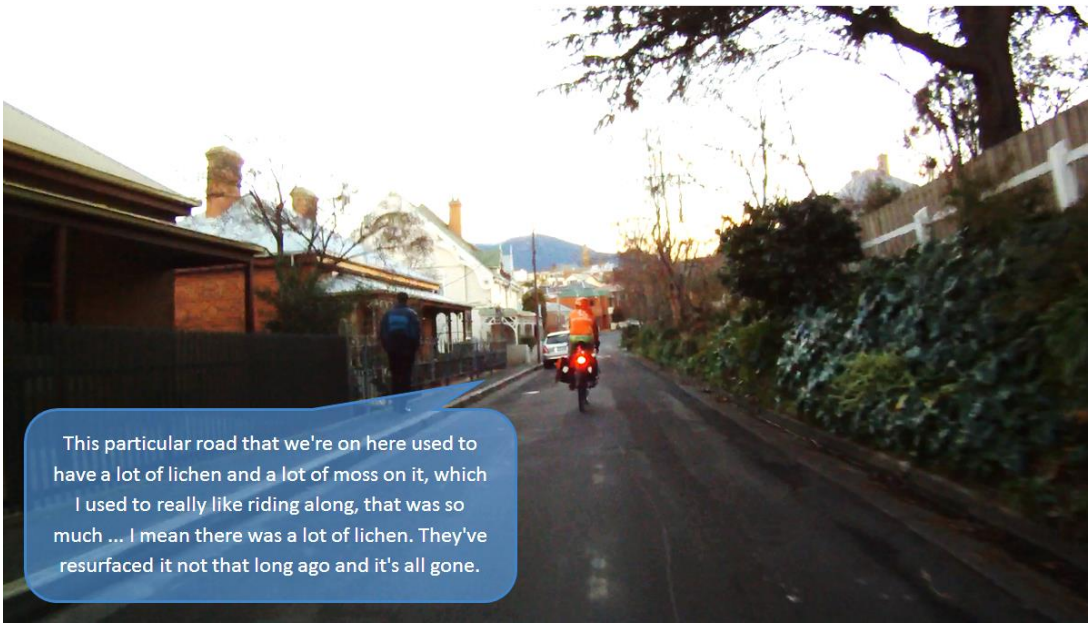

Figure 5.8 – Lichen (Phil)

Whether it was the tactile feel of the surface, being not slippery, not rough, but noticeably different from every other surface, or whether it was missed as part of the street setting was left unsaid. Surfaces mattered, but usually through the language of roughness and smoothness. Other affects were sometimes implied but appeared to be experienced outside more conscious awareness. Brown's study of mountain biking and walking in natural environments away from built-up urban spaces found that mountain bikers (more so than walkers) readily expressed the pleasurable sensations and feelings of biking on natural, textured and at times rugged terrains. According to Brown they, 'clearly valued the physical experience of texture' (2016, 4). Compared to urban cycling on the smoothed-off, concrete and asphalt roads and footpaths of this study, these largely standardised surfaces promote little conscious awareness other than when discontinuities, such as potholes, assert themselves. This is unsurprising, too, as cyclists' conscious awareness of factors such as cars and traffic would often be crowding out the subdued, felt sensations of cycling on paved surfaces.

The subtly affective textural qualities of surfaces, while appearing to resist expression in the spoken words of qualitative interviews, were manifested in the bumping and rattling of the video recordings (introduced in the 'problematic camera noise' section in the methodology chapter). This research encounter with camera noise is investigated in more depth in the final theme of this chapter, *shaking, rattling*. The findings of this section on riding surfaces, and

those of the *shaking rattling* theme, are further developed in the 'Surface Affects' section of Chapter 7.

Theme 2: Mobile entities

Creating space, sharing space

The 'moving places' of bike-riding are often spaces busy with other mobile entities – vehicles, pedestrians and, occasionally, other bike-riders. These moving entities change the spatial patterns around them. Spaces are continually opening up and closing off. For the bike-rider that space, or the lack of it, enables and constrains their ride. How bike riders engaged with changing spatial configurations created by other mobile entities, rather than with the entities themselves *per se*, is the subject of this theme.

For the participants even preferred routes have drawbacks at different times:

> It's a good route until you get to this intersection. If there's a car turning right and there are parked cars, there's a real bottleneck there and it can be a bit dangerous (Cam).

This requires a sharing of space but also, as will be seen, the resourcefulness of creating space. Amy talked about her occasional frustration with needing to share space:

> There are kind of moments, when, with the near misses, I think why am I doing it? That frustrates me and kind of exhausts me. And that's where a lot of the fighting side of me says, 'I shouldn't let them [car-drivers] dictate how I want to do things [in that road space]' (Amy).

For Amy, and for others, this was not necessarily a matter of becoming more assertive. There were times of acting assertively and times for resorting to other options. For cyclists, maintaining momentum enabled options. Maintaining momentum also requires less expenditure of effort than stopping and then regaining it. Having to stop and then start unnecessarily was said to be annoying:

> Sometimes cars don't signal … I've noticed that with bikes, sometimes they won't signal for you if they're turning, which really annoys me because you have to stop, get off, then get going again (Sarah).

Allie and Alice commented on their strategies to stay moving, but in the space of their choosing:

> This intersection, it's usually a busy intersection anyway, and then coming out of it, is a really steep hill, and you've got a lot of cars coming home at the end of the day, and you know that you'll be holding them up because there's not a lot of room for everyone to move. So, I just feel a lot safer on the footpath at this point (Allie).

> This one I found really tricky, because I quite often struggle to get with the flow of the traffic, get to the right speed, and then I slow down through this intersection. If there's a big line up, I'll abandon that whole concept, go onto the footpath, and cross at the lights with the pedestrians (Alice).

Alice talked about creating her own space as a strategy for negotiating a difficult right hand turn while staying on the road in traffic:

> I'm centred because I need to go straight ahead. I don't want a car to pull up beside me on the right-hand side that wants to turn left, so I make it obvious that ... well, I'm occupying the entire lane, and so nobody can get in beside me there (Alice).

Making room or creating space by being clear and deliberate around intersections, that is, occupying and being seen to occupy space, was a skill used between intersections, too. Adele talked about how riding overly close to gutters reduced her options for skirting roadside debris:

> I just want to give myself a little bit of space to play with. So, if I come across anything, I don't have to surprise traffic by dodging into them. I'd rather dodge into a bit of [my own] space (Adele).

The participants' tactics of occupying space, making space, or choosing new riding spaces were ways of moving in and through the spaces and places of their travel. Moving off roads and into the riding spaces of footpaths was an option used by every participant. How they occupied these spaces, though, was often quite different.

Riding on footpaths, however briefly, was a feature of most rides. In all of the trips that were filmed twice, participants rode the same stretches of footpath. In Launceston, different participants chose almost exactly the same place to move off a major road and onto the

footpath to bypass a particular intersection. While riding footpaths and bike paths often provided a sense of relief from road spaces, participants were very aware of pedestrians and the often confined nature of these shared spaces: 'I'm very aware too, that it's a shared space. It's a bit tight' (Erin). Deb said:

> Yeah, I'm really wary of pedestrians on the footpath. I don't want to antagonise them and have an accident. Yeah, so I go very slowly on the footpath. I feel like the footpath is for pedestrians and there should be a bike lane for bikes. So yeah, I feel – I do feel awkward on the footpath (Deb).

Participants slowed down and created room for passing. There were often problems, though, in making their presence felt to pedestrians without surprising them. Sharing space by making space was very often the strategy:

> I go very wide because you do get 17-year-olds, Walkman-brandishing students, you know. He's miles away, after a hard day at Launceston College, so the strategy is to get wide of him and give him lots of clearance (Cam).

There were discussions about how to be seen and heard:

> That's the thing with pedestrians, too. They don't look. So sometimes you either have to stop or speed up to go past. I find that making noise, like ringing the bell or whatever, doesn't actually help, because by the time people realise what's going on, they just … They freeze or they panic or they … They'll do something unexpected. I find it more dangerous to do that than to just negotiate [past] them (Jack).

Several of Allie's self-recorded rides in Launceston were filmed on busy, narrow footpaths in the city centre. Figure 5.9 shows a typical encounter. It is highly unlikely that the pedestrian would be unaware of Allie but her bike riding presence was so benign that he continued on with head down. Allie's videos show her appearing to be treated more like another pedestrian than a bike rider.

Figure 5.9 – Pedestrians (Allie) (Self-videoed, helmet-mounted camera)

Amy's ride along a footpath in Hobart is another example of sharing spaces (Figure 4.2). The footpath is wide, but there were people, including young children, preoccupied with walking, playing, talking on phones, and conversing. Amy moved quite fast, often passing close to people, but her presence was hardly registered. Again, Allie's approach was to move through deliberately, smoothly and non-threateningly, being mindful of the patterns of pedestrian movements. Taking the opportunities offered by these moving spaces opening up, or smoothly changing ride lines when moving spaces were closing off – creatively engaging with the constraints and opportunities of these shared spaces – is how bike-riders inhabited pedestrian spaces.

Theme 3: Shaking, rattling

The fieldwork issues introduced in Chapter 3 as problematic noise are revisited in more detail in this theme. Rather than ignoring the camera-generated noise, the theme resulted from recovering this noise as data by interpreting NVivo-based graphic traces of the camera audio to explore cycling encounters with pavement surfaces and textures. The experimental development of this theme was encouraged by Dewsbury et al.'s call for a 'resolute experimentalism' in 'rearticulating what counts as significant' (2002, 439-440).

Fieldwork issues

Excessive camera vibrations appeared in the very first follow-along. A 60 second excerpt shows the amplified bounciness of the camera.

[Video 3 – Shaking rattling]

Early trialling of different positions and mountings had established that a degree of camera shake was an inherent and unavoidable characteristic of a video camera mounted on bike handlebars and even those on the top of helmets. As such, camera shake was initially understood as video noise, never to be truly eliminated but acceptable while at low levels. Throughout the fieldwork, the instabilities of the camera featured as *camera-bounce* and *camera-tilt*. Video 1 features bounce and tilt (Amy's storyboard in Figure 4.2 is another example of camera tilt).

Camera tilting was not uncommon and was readily righted if it happened to be noticed. My concerns about the camera shaking and rattling, however, always overrode my concerns about camera tilting. Watching extended episodes of erratic bounciness is far more distracting than a picture that tilts and then remains stable. While the camera tilt could be easily remedied, the shaking and rattling would enigmatically and frustratingly reappear whatever 'fixes' were tried. After one exasperating episode, I refilmed the ride with a head-cam as a backup. The dampening effect of my body through the helmet to the camera was less than I imagined, as there was still a level of shaking and jolting present. It became apparent that a degree of visual shaking was tolerable; I reconciled myself to the fact that the participants seemed to quickly adapt to it.

The problem, though, was not just the visual shaking. The shaking caused rattling in the camera mounting components which was then picked up by the audio recorder. Before the fieldwork started, the audio capability of the camera offered the chance to pick up the sounds of the ride: gear changing, passing cars, wind and even, on slower uphill climbs, the sounds of breathing. The audio recorder could capture all of these things and more. The problem was that the recordings were mostly dominated by the sound of a rattling camera mount. Rather than the sounds of the ride enhancing the vision, the rattling effectively overwhelmed other sounds. During the interviews, the video audio was often turned off because of the persistent rattling.

As with the camera tilting, the participants mostly accepted degrees of shaking and rattling (when the audio was on) without comment. Amy, who self-recorded with a handlebar-mounted camera and one which also generated vibration-driven rattles, noted that the rattling evoked:

> That accentuated kind of jumpiness aspect … in terms of jumping up and down. You really kind of feel that sensitivity, that movement coming up from the ground (Amy).

On the other hand, when I pointed out to Sarah that a section of road was bumpy on the basis that the vision was jumping around, she replied, ‘yeah, that's interesting … I didn't feel it when I was riding down that bit’.

During the rides, the rattling from the handlebars did not particularly annoy me. In hindsight, it seems strange that these sounds were easily absorbed and ignored as the white noises of the ride – the mundane backdrop of cycling. If anything, the intensity of the sound, in time with the intensity of the felt shaking, was oddly reassuring, the sound feeding back into and echoing the bodily experience. The smaller, uniform vibrations of, say, riding a smoother road, quickly dissipated and were easily subsumed. The sharp bumps or jolts of rougher sections, transmitted up through the bike to the rider, were felt as affective spikes – via hands gripping handlebars, feet on pedals and buttocks on the seat – as much as they were heard.

There is another instance where the use of bicycle or helmet mounted video cameras has generated associations with felt or haptic experiences by similarly reinterpreting video noise as something other than a failure to capture images. The ‘blurs, shakes and smudges “catch” the jumps and shudders translated through the frame of the bike reminding the viewer of tacit

experiences,' writes Jungnickel (2015, 138) of the blurring and distorting of time-lapse images gathered with a bike-mounted video camera. Resisting the urge to delete streams of these failed images enabled Jungnickel to used them as a means to bring the experience of cycling to life by 'recovering' the feel of a pothole, the swerve of a quick turn, or the sense of fast-passing cars. *Shaking, rattling*, though, is not just about recovering research 'noise' through foregrounding the experience and sensation of cycling-generated vibrations. The theme draws on another unexpected representation of normal shaking and rattling on cycling to systematically analyse the somatic spikes of affect across each cycling video.

Spikes of affect

Towards the end of the fieldwork, my methodological concerns with noise were shifting. If camera noise is conceived as the chattering of mounting components, these chattering rhythms were influenced by many phenomena. Their rhythms could be scattered, muffled or amplified by things such as riding speed and tyre pressure. Nonetheless, it was a sympathetic beat, a pattern born of the real-time encounter between bike-rider and undulating road. As the research progressed, a screen in NVivo was serendipitously found to hold a novel way of understanding these patterns. NVivo displays the audio recording as a graphical trace above the video playback screen as an aid to tracking conversations (Bazeley and Jackson 2013). The trace is both a place-time portrayal of the sound intensity at any moment and of the sound pattern across the whole ride. Naturally, these audio patterns feature not speech patterns but a mix of ride-related noises, including the rattles tracing out the road surface patterns. These spikey expressions of noise mark the places of marked jolting and bumping, and are conceivably related to the spikes of felt cycling affects. These rhythmic audio patterns are a form of representation of the complex interplay of the bike-rider, mobility and surfaces.

Four examples are provided showing how NVivo was adapted to reimage the interplay of bikes and surfaces as something more than nuisance noise. Figure 5.10 is a still from Jack's ride showing his tricky section, again with the 'deadly' repair (Figure 5.7). Along the top, the graphical trace shows the camera audio levels across the entire ride. The time scale is displayed in minutes and seconds. The blue marker highlighting the 'elapsed time' moves progressively from left to right while the video is played. The marker indicates the moment in time at which the still was taken.

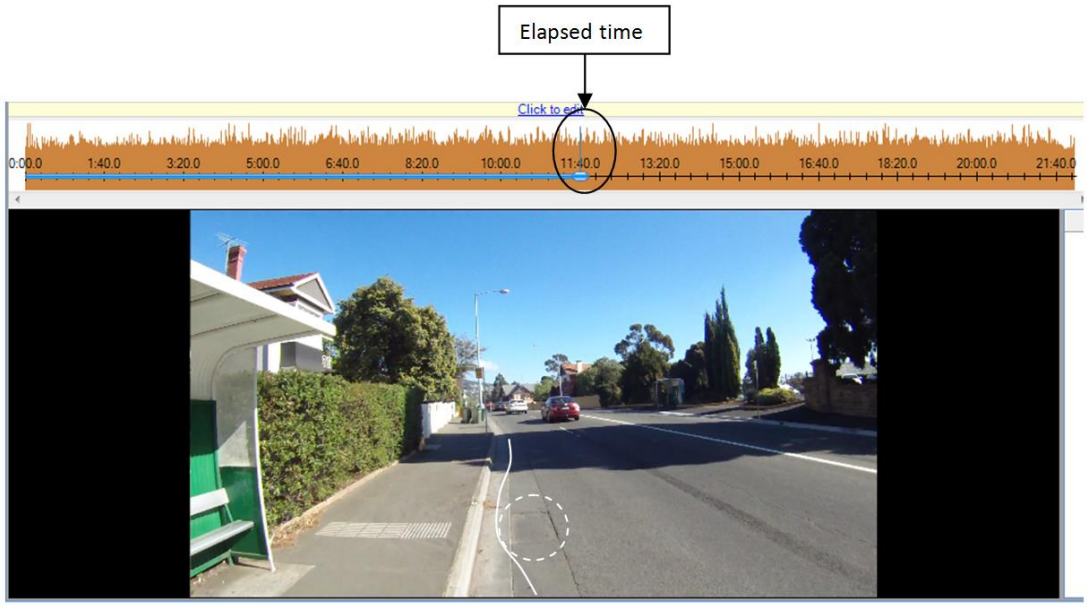

Figure 5.10 – Sandy Bay Road, Hobart (Self-videoed, helmet-mounted camera)

Examining the image, the road is quite wide, with ample passing space. Jack, though, finds this whole section tricky. Part of the problem is that Jack's preferred ride line is on a long strip section of road which has been repaired. The strip is somewhat rougher than the rest of the road but allows Jack to stay well clear of the car traffic. The dilemma for Jack is that he is fast approaching one of a series of poorly repaired patches (circled) within the strip repair – repairs over repairs. Jack is forced to skirt into the gutter (solid line). The graphical readout shows a relatively uniform spikiness. Because Jack skirted around the dip, there is no corresponding spiking of the audio apparent. There is little doubt that Jack's helmet-mounted camera helped dampen the bumpiness of his fixie ride. Still, the patterns of spike attest to the rigidity of his fixie, and the record of audio spikes correspond to a degree of shaking, rattling and, presumably to some extent, felt spikes.

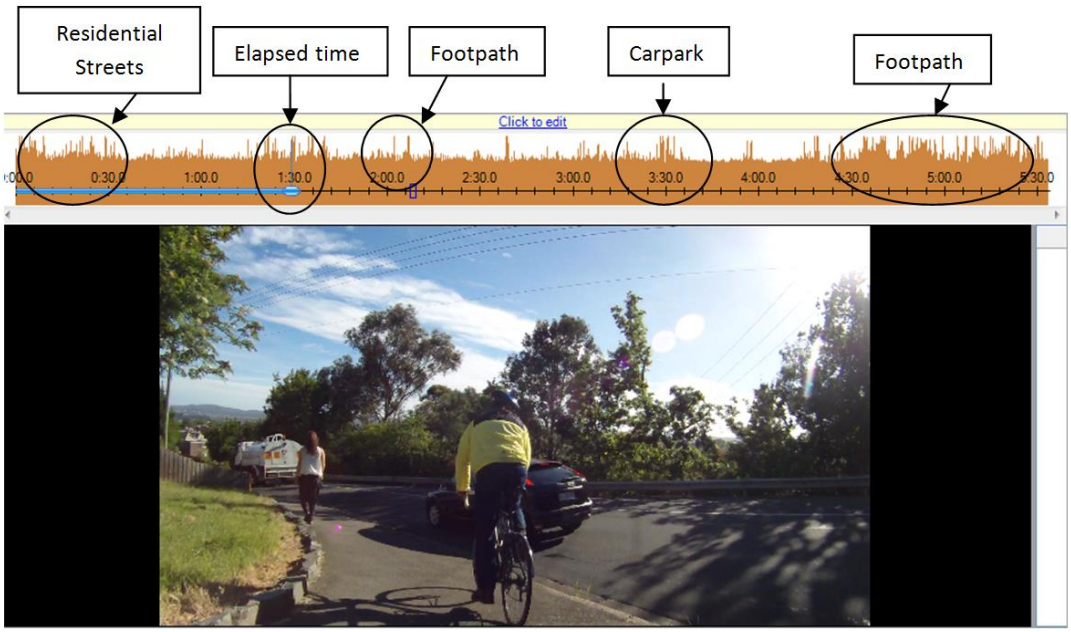

Figure 5.11 – Hillside Crescent, Launceston

The second still (Figure 5.11) is taken from a ride into Launceston city on a busy weekday morning during peak hour, again with the camera handlebar-mounted on my bike. About half of this short ride (around five and a half minutes) is downhill. The still shows Cam on the footpath, and the first of four off-road segments is highlighted. The next segment was along another footpath. We then returned to the road for a short time before cutting through a carpark. Time was spent waiting, stationary, for a space clear of traffic that would allow us to briefly re-join the road, before spending the last minute almost entirely on footpaths to travel the final distance to Cam's destination.

Each of the off-road segments shows distinct spikes in the intensity of the camera's rattling (and shaking). The very first part of our ride on suburban roads shows a distinct pattern suggesting a rougher ride there than the rest of the ride, which was all on smooth main roads (Figure 5.11 is an example from about a minute into the ride). It is quite possible, too, that the intensity of rattling is linked to the speed of travel. As Cam alluded to earlier, a little bump could become perilous if hit at high speed (or in wet conditions). The relatively spike-free patterns for the on-road segments indicate that even at speed, wherever Cam's ride lines took us, the surfaces were very smooth. For each of the off-road episodes, though, Cam's speed slowed significantly. Sharing space with pedestrians on narrow footpaths meant slowing almost to a walking pace at times. The audio trace, however, ramps up significantly.

Footpaths, even traversed quite slowly, registered significant audio rattling, with the likely source being rough riding surfaces.

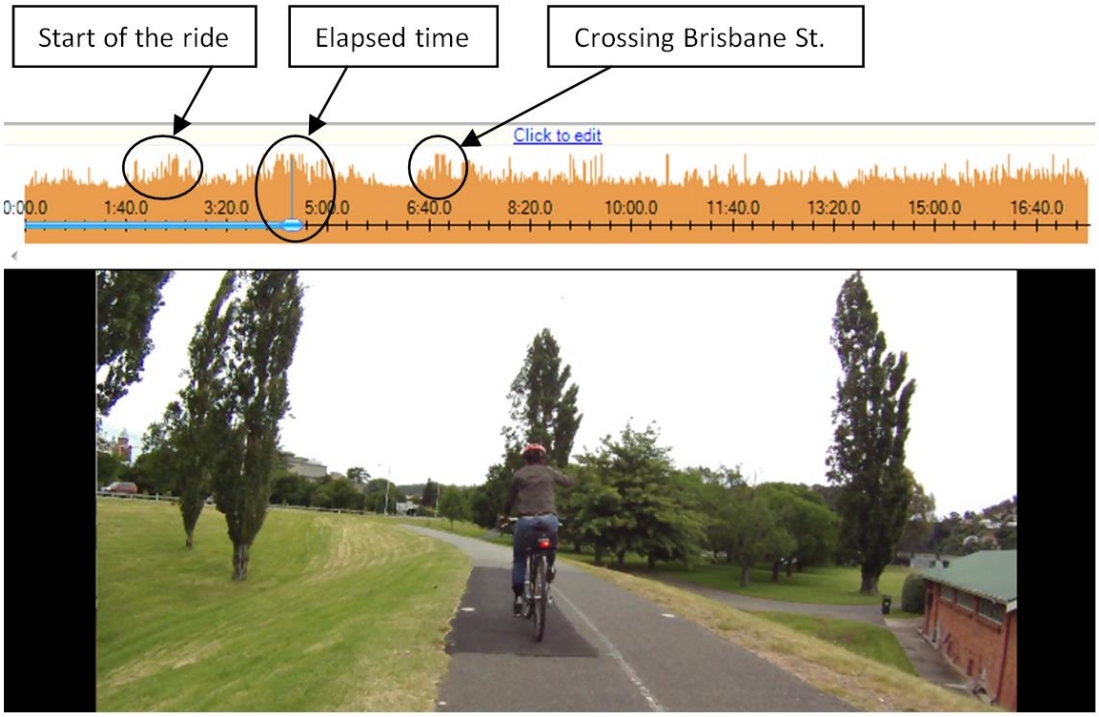

Figure 5.12 – Royal Park, Launceston

Figure 5.12 shows Alice riding along a bike path in central Launceston. The image was taken from her evening commute home. It was a blustery day. A mix of rattling, wind and general ride noise can be heard on the audio, but the rattling can be heard as distinct sound spikes, especially at slower speeds. The first part of the ride was through the backstreets of Launceston CBD, coinciding with the first series of spikes. After spending time waiting at traffic lights, we moved onto the bike path shown in the still. Again, the row of higher noise readings roughly coincides with the time spent on the bike path. The initial patchiness of the path is shown, but the rest of the path appears in the videos to be a good cycling surface. The trace drops down again during another pause at traffic lights, after which a significant spike occurs. This coincides with our Margaret Street crossing of Brisbane Street. The video of this segment (detailed in the following section) shows the roughness of Brisbane Street, which carries heavy volumes of traffic from the West Tamar Highway into the city, and a series of metal covers along our ride line (artfully avoided by Alice, but perhaps not by me). The audio also draws attention to the complexity of differing noise sources, as the wind noise also spikes up across the intersection.

Figure 5.13 – Argyle and Strahan Streets, Hobart

The final NVivo trace (Figure 5.13) shows the corner of Argyle Street and Strahan Street, Hobart. For the first minute and forty seconds we walked our bikes along crowded footpaths in the Hobart city centre to reach Argyle Street, during which the audio trace is quite subdued. We then mounted our bikes and rode along Argyle Street. From about the three minute mark on the audio trace until turning into Strahan Street, we rode in the bike lane shown. The last 'spikey' section coincides with our short uphill ride in Strahan Street. Argyle Street is a busy thoroughfare into Hobart city. The audio trace for Argyle Street is one of the most uniform recorded across all the videos. In Strahan Street, we slowed down, but the camera rattle shows a significant increase, most probably due to the roughness of the road. The NVivo image shows the patchiness of the surface of Strahan Street, broken up by metal covers and patches of bitumen. Argyle Street, on the other hand, including the bike lane, appears quite smooth.

The audible rattling and visual shaking reflect, in some way, the degree of roughness or smoothness of riding surfaces. The rattling and shaking was exacerbated by looseness in the camera mounting but represents, in some manner, a dynamic co-production of bike-rider + surface-texture + mobility. There is always some level of bike-rider shaking and rattling, with or without a loosely mounted camera to amplify and record it. The patterns reflecting rougher surfaces coincided with footpaths, minor roads and even, sometimes, bike paths – almost

always ridden at slower speeds. Speeds on footpaths were notably restrained, even in the absence of pedestrians. The poorer surfaces appear to act as natural speed limiters to cycling in similar ways to speed humps on roads. The more major arterial roads appear to be smoother than suburban roads. Often, though, bike riding takes place on the patched, uneven edges of otherwise smooth arterial roads, such as Sandy Bay Road (Figure 5.7).

This research also highlights the routine and lower-key felt vibrations which act, amongst other things, as semiconscious registers of surface affects. These are not unduly disconcerting until felt as a jolt or bump, as the *infrastructure* theme demonstrates. The audio recordings show patterns of vibration which at times spike up in tune with the changing road surfaces. Sharp spikes coincide with sharp bumps, and perhaps with sharp spikes of affect perceived through hands, feet and buttocks. The complex interplay of bike-rider and road surfaces is a mundane and ever-present encounter and perhaps, therefore, easily overlooked. As is the case for the methodological issues of noise, these findings show that surface encounters need to be researched, rather than dismissed, supressed or ignored.

The absent-presence of riding surfaces

Road surfaces are barely mentioned in two notable auto-ethnographic accounts of the embodied practices of cycling. Jones' use of 'my body itself' (2005, 827) as a research tool in his performative approach to interpreting urban space though a daily commute drew on the notion of affect to illustrate the physical and material nature of his encounters with the city. Absent from Jones' detailed narration of riding from home to work is an account of the bodily experience of encountering urban architecture and infrastructure – the 'stage' for Jones 'performing' the city. Likewise, Spinney's rich and detailed account of cycling drawn from a series of training rides to the summit of Mont Ventoux in France largely overlooks the ever-present interplay between the cyclist and his bike and the interplay of tyres rolling on asphalt. Spinney relates how his work focusses on the 'kinaesthetic – the embodied feeling and experience of movement' (2006, 715). As the climb progresses towards the summit, the sheer exertion of cycling up this mountain is contrasted to his experience of sensing and then accommodating or overcoming the micro-changes in the road's surface and gradient, and not least enjoying the momentary relief of its smoother and flatter sections. But while *hearing* the contact of his tyres on asphalt, and, with head down, *seeing* the expanse of road surface (and little else) filling his vision, Spinney misses the kinaesthetic exchange of *feeling* those

surfaces as textures. As he writes, ‘there is nothing to do but fix your eyes on the road and think of something else’ (2006, 722). Bodies and materialities cannot be divorced when researching cycling. However, mundane material exchanges, such as the riding reverberations generated out of surface interactions, are perhaps all too familiar and therefore easily overlooked.

That both of these accounts miss the affective feeling of riding surfaces is, in a sense, understandable. Jones (2005) describes the shifts and changes in urban architecture and street engineering from one road to the next. As with the participants in this study, there are sections of his ride that are dense with traffic. Jones relates how these sections seemingly bristle with the possibilities of destabilising his bike and body. The small-scale, on-going event of active rhythmic interactions between tyres, bikes, bodies and surfaces is much more low-key and easily missed.

For Spinney (2006), seeking a kinaesthetic awareness and understanding of his mountain ascent, the sheer physicality of the ascent dominated the felt sensations reported in his reflections. Spinney reflects on the mechanical rhythms of the ride, of sprockets and chains turning, but his descriptions miss the haptic rhythms of the mundane asphalt. The continuous but minor agitations felt from road surfaces appear to be easily overlooked even in these two extended narrations based on embodied sensations. Jones does allude to the possibility of a less-than-ordinary surface encounter, but immediately shifts the focus to a fast-moving vehicle:

> The cyclist’s fragility seems all the more acute when the slightest miscalculation could send the body hurtling across the asphalt. Indeed, from this perspective, the possibility of colliding with a fast-moving car makes that vehicle seem all too material (Jones 2005, 821).

Even without the presence of other vehicles, miscalculations with bumps or slippery surfaces can send bike riders hurtling across the asphalt. As with Jones, however, the all-too-material presence of the car was at the forefront of the accounts and experiences of this study’s participants. The absent-present nature of surface encounters can mean they are easily overlooked, but eventful encounters can happen because of a failure to fully apprehend the nature of those surfaces.

Reporting of the ongoing encounters cyclists have with pavements is often overlooked even in papers focussed on fine-grained cycling interactions with road infrastructure. Latham and Wood (2015) used video and interview methods in studying the way cyclists inhabit road infrastructure, but ubiquitous encounters with road and footpath surfaces are missing. While the material strength of road infrastructure is extensively portrayed as prioritising the mainstream flows of motor cars, the hard (and usually smooth) surfaces of roads and footpaths also enable cycling. The affordances of the pavement infrastructure ridden over are overlooked. The 'above ground' road infrastructure of roundabouts, signs and lane markings, and the large volumes of motor traffic funnelling through busy intersections, take precedence over unnoticed paved surfaces.

Ingold contends that there is a bias in Western thought which elevates 'the plane of social and cultural life over the ground of nature' (2004, 315). By valorising cognitive thinking over embodied feeling – the preference of head over heels, as it were – Western cultures have lost touch with haptic perceptions of the environment, including through foot contact with pavements. Ingold argues for a different approach to urban travel:

> The groundlessness of metropolitan life remains embedded not only in western social structures but also in the disciplines of anthropology, psychology and biology. A more grounded approach to human movement, sensitive to embodied skills of footwork, opens up new terrain in the study of environmental perception (2004, 315).

Although Ingold's emphasis is on pedestrian movement, this approach can be usefully translated to cycling, where footwork is also integral to mobility. Foremost in this approach is a view which does not overlook the interactions between pavement and feet, one that literally grounds human beings in the everyday business of urban travel. Ingold (2011) also points out that vision, rather than any of the other senses, dominates the detailed and influential work of Erving Goffman's (1971) studies of pedestrians. According to Ingold, Goffman portrays the experience of walking as a series of interactional rituals made up almost exclusively of visual interactions *between* pedestrians. In Goffman's studies, 'the physical capacities [of human agents] both enable and constrain the forms that interactions can take' (Smith 2006, 7), but the physicality of walking is detached from pavement interactions. Goffman's street-based study of pedestrian conduct almost completely overlooks street pavements – except, as Ingold points out, when scanning for 'small obstructions or dirt' (2011, 328). Yet, according to

Ingold, it is through the footwork of pedestrians on pavement surfaces that their most sustained and fundamental interaction takes place.

The embodied and affective experiences of the rider on pavements, enabled through the bike and felt through feet, hands and buttocks, is different from those of the pedestrian enabled by the shoes and felt through the feet. The combination of rider and bike works as an extra-somatic extension, able to amplify (or at times dampen) sensations. For the participant Jack, riding a more rigid fixie bicycle amplified the roughness of roads but also accentuated their smoothness. In contrast, his mountain bike smoothed his ride over rough roads but dulled anticipated encounters with surfaces. Jack had less feel for the road on his mountain bike. This co-constitution of bike and body, the bike as an extension of the body (and the body as an extension of the bike), amplifying or dulling sensations, conjures up the theme of *fused to the bike*. For Thrift, the human body is constituted as a 'tool-being' (2008). The tool-being of the bike and rider not only produces the ride; the meshing enables the constant work of maintaining the ride. Tuan (1993) points out that in running a stick over pavement, the feel of the surface texture appears at the end of the stick as though it were an anatomical extension of the self.

Grounded in space and time

The analytic approaches of *timing* and *spacing* adopted for Chapters 4 and 5 were useful aids for identifying and working through those findings more spatially or temporally oriented. Conceptually 'separating' the timings and spacings of bike riding through is problematic, and perhaps this was most apparent in the ostensibly timing-based theme of *riding lines*. The participants were able to point out the more readily apprehended spacing aspects of their ride lines as we watched the videos. The footage showed, for example, their practices of skirting around parked cars. It was the timing aspects of riding lines however that were highlighted as much as those of more readily apparent spacings. *Riding lines* shows the intertwined nature of time and spaces, and the challenges of 'separating' them, but also the opportunities for thinking about mobile practices and the makeup of their spacings and timings.

For Crang and Thrift, time and space appear irrevocably bound together; 'space is exceedingly difficult to write about shorn of its relation to time' (2000, 1). Geographers, though, have been described as valourising space over time, thereby practising a type of

'spatial imperialism' (May and Thrift 2001, 2). To overcome tendencies to differentiate space and time, and without prioritising one over the other, Massey (1994) introduced the notion of space-time as an interweaving of space and time. It is more challenging again to think in terms of multiple space-times as proposed by May and Thrift, but they still see such conceptualisation as 'a conscious attempt to move still further away from any separation of the two [space and time]' (2001, 3).

The mobile practices of cycling were found to be very much grounded in the space *and* time of the journey. The theme of *riding lines* showed that what is readily understood as the line steered by bike riders reflects the timing aspects of speeding up, slowing down, coasting and sometimes stopping. Riding lines are examples of co-productions of timing-spacing-acting, very much grounded in the time-space encounters of the journey. The modernist tradition of overcoming time and space is portrayed in Latour's (1997) example of a passenger on the high-speed French *Train à Grande Vitesse*, or TGV, who feels like he has *displaced* time-space in his smooth, high-speed journey across France. He has little or no sensory awareness of speed or of the places travelled through. On the other hand, the unavoidable sensations and awareness of cycling, the corporeal consciousness of the immediacy of time which is grounded in space, are different. This is not the experience of a body overcoming time and space, but of occupying time-space. In thinking about the functionalism of road spaces as transport corridors, Stratford notes:

> Of all of the 'overcoming of moments', transport is surely one of the most powerful. And not just in the figurative or metaphoric sense, but in the material sense. If you are barrelling at 110 kilometres down a road, you are overcoming space and time, those things which ground you in place. You aren't necessarily in the moment. (Stratford in Bonham and Ferretti 1999, 114)

Intensities of awareness can be thought of as a cluster of ideas, but always with a sense of being grounded in the time-space affects, encounters and events of roads.

Moving on

The storyboard below (Figure 5.14) and the accompanying video of the crossing of a busy intersection gather together many of the findings so far.

[Video 4 – Brisbane Street crossing]

Once again the stills from the excerpt are read from top to bottom in their columns starting with the top left-hand still. The short excerpt was taken in a swirling, buffeting wind in Launceston during evening peak-hour traffic. Across all of the frames, the fluidity of bike and rider smoothly and predictably negotiating rough road, then negotiating the slight surprise of a passing car and finally a lane change, is evident. The shifting ride lines find smooth surfaces and skirt around areas of roughness. Crossing the intersection, the ride line deftly avoids the multiple metal covers, while edging away from the passing car. The drive lines of the three passing cars reflect a similar desire to that of the bike-rider to create as much separation as possible. Alice's potentially problematic manoeuvre in leaving the bike lane early and entering the fast-flowing car lane shows her habit of looking, listening, checking, and signalling intention. Of all the action throughout all of the videos, the momentary surprise of frame 4 is the closest a participant came to what could be termed a close encounter, or even a near-miss. Alice was caught momentarily unaware because of the gusting wind blanketing the sounds of the passing car. In a hurry to catch the green light (perhaps), the driver is still seen to be creating space between bike and car.

Figure 5.14 – Brisbane Street crossing (Alice)

Chapter 6 Journeying

The themes dealt with in the last two chapters were orientated to the temporal and spatial dimensions of bike riding. In travelling from origins to destinations something more than a collection of actions and activities in time and space emerges. This final findings chapter sets out how the moving moments and the moving places of bike riding cohere as a cycling practice: the timing-spacing-acting of bike riding. Journeying can be thought of as the seamless trace of the overall course and event of a journey. To be fathomed, journeying needs to be grasped whole and cannot be built up from the study of discrete, disconnected moments and places of travel, just as a footprint in sand can only hint at the whole journey.

This chapter presents the following three themes: *reasoning and sensing*, *collaborating*, and *making journeys: waymaking*. *Reasoning and sensing* grew out of the *why* of cycling: why the participants cycled. Ostensibly this was addressed in the language of utility, as a reasoned or rationalised response to the question. A close reading of the transcripts showed another dimension to this theme that was couched in talk of the rewarding sensations of cycling. While people could readily articulate both the reasons for cycling and the sensations of cycling, the latter was more frequently linked directly with the question.

The second theme, *collaborating*, emerged out of three codes which together generated the most intense levels of responses in NVivo. *Collaborating* shows how co-producing their encounters with car-drivers was uppermost in the minds of the participants throughout their journeys. The final theme, *making journeys: waymaking*, synthesises the eight themes across Chapters 4, 5 and 6 into the concept of Waymaking. Waymaking is the ways in which cycling journeys are brought into being (and two specific examples of the practices of cycling waymaking are detailed in the next chapter). *Making journeys: waymaking* uses a final storyboarded sequence to illustrate the practiced, poised and capable figure of the bike-rider.

Theme 1: Reasoning and sensing

The findings to date have elaborated *what* takes place when cycling, and *how* it takes place. This theme is focussed on *why* participants cycled. Why people cycle is important in understanding what sustains everyday routines. This theme is based on the ways participants portrayed their choices to regularly travel by bike rather than other means. All but one of the

participants was a licenced car driver, and two did not own cars. This theme is organised around two interpretative patterns: *reasoning*, or the more reasoned, instrumental and knowledge-based motives; and *sensing*, or the more sensation-based motivations found in the immediacy of moving moments and places.

Reasons given for bike riding by participants covered a mixture of convenience, health and wellbeing arguments. However, in explaining their motivation to cycle, participants also drew on embodied and felt experience tied to the sensations of regular bike-riding. Whether the accounts were thought of as *reasoning* or *sensing*, both were seen as empowering aspects of bike-riding practices. In some cases, categorising accounts as either *reasoning* or *sensing* was difficult. As with much of the thematic work, there is overlapping and blurring. For example, wellbeing was discernible both as a motivation for staying healthy by riding regularly *and* as the felt sensations and experiences of wellbeing during a ride.

Reasoning

Several participants referred to the personal and societal benefits of cycling as healthy, inexpensive and environmentally-friendly travel. For Andy, a physical education teacher, this bundle of factors and influences was part of his cycling identity:

> And I think that …biking, cycle commuting, is part of my identity, it is part of my professional practice. For me it's the part of walking the talk, you know, around sustainable transport, around health and wellbeing (Andy).

Holding true to these professional and personal values sustained Andy's ride to work though potential discomfort and difficulty; for example, the often cold, wet days of a Launceston winter. By cycling, and being seen to cycle, Andy was aligning his everyday routines with his beliefs and values.

Bike-riding was found to empower bike riders in ways that other travel modes did not necessarily do. Easy access to parking was one frequently cited example. The ease of finding bike parking close to destinations in city centres and places of work was often contrasted with the inconveniences of finding car parking. The convenience of being able to ride 'door to door' appealed to many participants. When I rode with Deb through Hobart, and Mark through Launceston, we looped around to businesses, shops, government departments and

post offices. Each time we stopped, we were able to find parking spots close to front doors. While parks were found on footpaths and near entrances, participants were careful to position and angle their bikes to minimise the intrusion into walking spaces. Deb talked about using signposts as ready-to-hand parking spots at most destinations.[14] Allie's self-video footage shows her stopping and starting from spots on the footpath just outside city shops and cafés. Allie compared parking her bike to parking her car:

> In a car you're just in focus, let's get there. Then inevitably it actually takes longer because you've got [to] find a car park. You gotta be mellow in a car, but I really hate finding a car park, when I'm thinking 'if I was on a bicycle I would have been there by now' (Allie).

Quite a few participants talked about the convenience of using their bike for short round trips. For two participants living relatively close to their work place, it was an easy way to return home if they needed to. Daniel was adamant about the convenience of using his bike for his short lunchtime trips into central Hobart:

> Absolutely, literally, door-to-door. So it's frustrating when people say that bikes should perhaps park on the periphery of central Hobart and people should walk in. It shows me that they don't really understand what riding a bike is like. You want to ride right to where you're going (Daniel).

This practicality and convenience, along with values and beliefs, were enabling reasons and rationales for bike-riding. At times, though, parts of the participants' journeys invoked more reflective language, and their thoughts became less easy to articulate.

Sensing

States of wellbeing, of feeling comfortable, happy, or healthy were reported, but in ways that conveyed deeper states rather than, perhaps, sources of reasoned motivation. Allie's words provide a glimpse of an embodied experience reaching beyond reasoning:

[14] Ironically, given the general car parking restrictions enforced outside city offices and shops, these may well have been no-parking signposts.

> But there is a repetitiveness, and I find that so soothing. I just feel calmer when I'm exercising, and the breathing, the deep breathing that I talked to you about, it just feels, like it clears you out, all the bad feelings and stuff. It feels deeply satisfying (Allie).

The slow-grind, repetitive effort needed for an extended uphill climb home effectively separated work, home, and other 'stuff' (Allie). On the climb, 'you can get it all out of your system', Allie reported. The physicality of riding home also featured in other accounts, as a way of shedding concerns and preoccupations. Watching the replay of Alice riding back and forth, climbing through the nine bends of a zig-zag section of a quiet road in a park-like setting, we could hear the effort of climbing. I remarked, 'you can hear me breathing'. We laughed and Alice replied, 'Yeah, there's a bit of breathing that goes on [on] that hill. Yeah,' she paused. 'Gets all the work things out of your system, that hill' (Alice).

Alice and Allie's 'processing' of their workday on their homeward journey through the focussed effort of climbing a hill shows the capacity of bike-riding to be an intrinsically evocative activity, in which all sorts of physical, mental and emotional rewards are possible. According to Heinen et al., in their review of the bike commuting research literature, 'the presence of slopes has a negative impact on cycling' (2009, 67). They concluded that, 'cost, travel time, effort needed and safety of a trip are important for cyclists' (2009, 75). While participants talked about the importance of all of these aspects, apart from cost, these presumably utilitarian reasons and rationales were also mixed with something more, as Alice and Allie's thoughts show.

Climbing hills entailed a focussed effort, an effort which in turn appears to give rise to eudaimonic feelings of wellbeing. Brown's (2016) study of mountain biking shows how the lure of cycling in rugged natural environments that need to be negotiated with a focussed effort also produces positive shifts in mood and consciousness, and does so in similar ways. Perhaps in apprehending the environmental qualities that are linked to cycling wellbeing (hills, settings, parks), more 'grounded' and situated understandings of cycling wellbeing might be distilled, understandings which move beyond the catchphrase of cycling 'health and wellbeing'.

The contemplative setting of trees and grass moved Alice to observe: 'It's a lovely little leafy climb … through the park'. Like Alice's uphill climb, sensations of wellbeing could be intimately tied to the ride setting, as much as to the physicality and focus of effort on a hill

climb. Mark talked about the setting of a short section of his ride through the Brickfields Park in Launceston (Figure 6.1).

Figure 6.1 – What I like (Mark)

One of Jack's self-videoed journeys home was filmed on a still, dark night. His video shows well-lit precincts giving way to darker areas as he leaves the city. The video also captures the atmospherics of quieter, darker places, and his breathing. The few cars that there were on the road become clearly visible even from a long way off as bright, moving beams. Jack's night time journey had a 'whole different feeling' (Jack). Like Alice and Allie's accounts, Jack's homeward journey was an encounter across space and time that settled into something else:

> Riding the bike at night, I find that quite exhilarating. I really enjoy it, because it's the end of the day, I don't have to worry about getting to school and things I'm going to do, being on time. I just … Yeah, that's actually a nice way to relax … it just feels different (Jack).

Jack's feelings of exhilaration link back to Amy's early talk of going with the momentum when riding a slightly downhill grade on an unremarkable street in Hobart (Figure 4.6):

> The long stretches, where you're just kind of free! There's a lot of wide spacing around so you don't have to pedal so much, you can just go with the flow of the moment (Amy).

Sarah's exuberant description of riding *to* work matched my recollections of following her as she sped down a short-sharp slope into a rollercoaster dip on Regent Street in Hobart: 'It's a nice way to start the day … that whizzing to work' (Sarah).

Within the limitations of typed text and comic book grammar, their words give voice to feelings, moods and values pushing beyond the framings of cycling wellbeing as merely feelings of being comfortable, healthy or happy. Throughout the narratives of sensing, more so than those of reasoning, are the glimpses of cyclists such as Mark cycling in the midst of things; the embodied, sensory interplay of atmospherics, moments, places and movements.

In the theme of *in the moment*, it was found that riders become intimately aware of their immediate environment by 'tuning in' to hazards and risks and blocking extraneous thoughts. Heightening awareness of imminent encounters was found to be a well-drilled riding practice. Participants talked about these seemingly 'natural' skills, but developed through practice and experience, that gave them confidence:

> I could probably count them [near misses] on one hand where I felt cars had gone much too close to me, to the point where I've sucked my breath in, but there's never been any contact. I'm just a naturally careful rider, and that is important to me (Erin).

Allie had been part of a buddy system in which she helped beginners learn to ride by accompanying them on their ride to work. Allie related the steps she used to help build the repetition and confidence of habit:

> Pick a good route and then, you know, you can get used to where the difficult bits are and how you negotiate them. Maybe you can go a different way. Once you got it sorted you don't have that anxiety. You know you're managing things all the time, you're [always] checking on the cars, but you're used to it, it is not that bad (Allie).

Amy's recent and vivid experience of relearning to ride is similar to Allie's advice:

> Just over time, you sort of build-up confidence ... all those little things … like what to wear, you know, how you fit onto a bike, how you move around. Well, you know that you'll cope! You know [you] can actually ride in a dress (Amy)!

Through the doing of everyday cycling, participants learnt and relearnt their mobile practice. They used their routines of exercising awareness and reading situations, along with the

embodied practices of balancing, pedalling and steering, to maintain their confidence in their cycling practice. They knew how to interact and collaborate with car-drivers as the following theme demonstrates. While confidence *per se* was not often discussed and never given as a reason for cycling, the videos show an implicit confidence in the way the bike-riders went about their riding. They stepped onto their bikes (unhesitatingly) and pedalled (confidently) out onto roads and into traffic.

What *reasoning and sensing* highlights are the links back to both the instrumental and more-than-instrumental setup of this thesis. Reasoning aligns with the utility of cycling as epitomised in the strategy of *build it and they will come*. Sensing taps into something that is more than just cycling as an instrumental means of efficient transportation from A to B. The sensation generated during a cycling journey shows cycling to be much more than a simple translation of the bike-rider entity through a suburb or across a city that leaves the entity essentially unchanged, that the bike and rider are moved in the physical sense but remain unchanged as an entity (Ingold 2011). Researching more-than-instrumentally recognises and seeks to understand those often ephemeral practices which constitute cycling rationales and the affective sensory responses which *move*, and ultimately change, that entity.

Theme 2: Collaborating

This theme emerged from observations of the encounters between bike-riders and car-drivers. What happens when bike-riders approach a busy intersection, and how do they manage timing and spacing to emerge unscathed on the other side? There can be little doubt that there is much at stake for cyclists in collaborating with car-drivers. This finding emerged from the centrality of these interactions, and from the reporting of mainly bike-to-car interactions in the participants' narratives. For the bike-rider negotiating the intersection, the analysis revealed the following sequence of action: checking and assessing the situation, signalling intention, and collaborating. While more difficult to observe and assess, and not strictly within the boundaries of this study, video observations indicated that car-drivers appeared to be following similar processes. The importance of *collaborating* is evident in the coding frequency of the three key codes in this theme (see Table 6.1). Each coding category was sourced from all eighteen participants, and the number of references found in each was extremely high.

This theme is set out in two parts. First, each of the three steps is introduced in turn. As with many of the findings there is considerable interplay and overlap between steps. The idea that these steps are taken 'one after the other' is useful but limiting. The second part details three examples of collaborations from the fieldwork, two from Launceston and one from Hobart. While this theme gives central importance to the interactions of bike-rider and car-drivers, encounters with other mobile entities – bike-rider to bike-rider and bike-rider to pedestrian – are also important. However, with far fewer such interactions evident, the research opportunities to study these interactions were limited.

Table 6.1 – Key coding sources for *collaborating*

Coding Category	Number of sources	Coding frequency
gauging, checking, assessing, judging	18	208
gestures, signalling, seeking (eye) contact	18	118
collaborating, asserting, accommodating	18	299

Assessing, signalling, collaborating

Intersections were data-rich sites of encounter. This is to be expected, as intersections are engineered to facilitate merging and diverging traffic. Intersections have already appeared in the theme of *infrastructure*, and these findings build on that discussion. When Daniel approached a roundabout, he was already assessing the situation and had been from some way back as he looked to merging with the (usually) faster traffic: 'I've sort of come to recognise the sort of situations where people will want to overtake' (Daniel).

Alistair rode on busy footpaths through central Hobart amongst pedestrians for the first leg of his journey home. He was continually checking and assessing:

> And then there are people that come out here, at this intersection here. I'm not sure whether they'll see you, whether they're going to push out in front of you. They haven't

> done it to me, but it's just something I'm very wary of. [I'm checking on] people leaving that side door there on the Duke, and then people coming around the corner (Alistair). [15]

Constantly scanning and assessing the riding environment recalls the active awareness of being in the themes of *in the moment*. When approaching intersections, the cyclists combined being actively awareness with communicating their intentions.

Intentions (to turn or to go straight through) were usually indicated by hand signalling. Shifting ride lines from the road margins to lane centres was another way that bike-riders announced their intentions – a case of bike-riders asserting their position and relying on drivers to read their bike-body language. All participants looked for eye contact as a crucial way of assessing driver awareness and signalling intent. Eye contact also announced intentions *and* began the act of collaborating. Sarah was careful to look for eye contact but was prepared to slow down (and be seen to be slowing down) if it was not made:

> I always try and make eye contact [with car drivers], particularly coming in at that angle. There's the pillar on the driver's right side, sometimes it's a bit of a blind spot for them. I've read some research that cars just don't see bikes. It's not a conscious thing, but they're not looking for bikes. So I really try and make eye contact to ... particularly if that car was a lot closer to that roundabout, I would've slowed down even more and made sure it was slowing [for me] (Sarah).

Making eye contact was an important strategy discussed by almost all of the participants. For Pat, even quieter suburban intersections needed special attention, and making eye contact was part of that:

> He just wasn't looking at my eyes … This guy was making me nervous, but he then looked down at the steering wheel and I thought, oh, he's not going to take off. So couldn't make eye contact with him, either. I feel much more secure if I know they've looked at my eyes (Pat).

Alice's strategy of a slightly exaggerated but deliberate weaving was aimed to draw the driver's attention and then to establish eye contact without (presumably) alarming the driver.

[15] The Duke is a Hobart hotel on a busy corner.

> I make sure I have eye contact with the people who are crossing in front of me to make sure that they've seen me. Otherwise, I'll go very slowly and weave around a bit, until they actually do see me (Alice).

Sarah deliberately slowed down to signal her presence and again without wanting to alarm the driver; though in Sarah's case being reasonably prepared to be annoying:

> And it can be quite scary, too, seeing them come, coming down the hill, whether they see you, I tend to slow down again, do the eye contact thing to make sure they're going to stop (Sarah).

Eye contact is, of course, a two-way interaction. Bike-riders were very wary of the possibility that car-drivers would not see them at all, and, to varying degrees, used bike-lights and clothing to heighten their visibility. I followed Phil on his ride home on a winters evening. We started in sunlight and finished about thirty minutes later in half-light. Phil wore a bright, 'Hi-Viz' top and had two bright flashing tail-lights, as well as a flashing front light. Phil's lights were the brightest of the cohort. While most of the filming was done in daylight, many participants routinely used rear and front lights in daylight, and sometimes set these running in the flashing 'hazard' mode. Sarah used flashing lights front and rear on every ride, including a ride in which she had a collision:

> Yeah, it's very bright isn't it? So, I basically use them as hazard lights. That's what I really wanted … something that the cars can see. Although, you know, I had them on, when I got hit (laughter). That was in the middle of the day, though (Sarah).

The focus so far has been on *what* happens when car-drivers and bike-riders interact, not *how* it happens. In the following extract from Allie, 'avoiding a collision' and 'not going to hit' sum up *why* car-drivers and bike-riders are intent on collaborating on their interactions:

> For drivers, for riders, for everybody, it is not just that you're going to avoid a collision; you need to make it clear to the other person that you're avoiding a collision. So you need to make other people feel relaxed. It is not enough to know you're not going to hit them; you need them to know you're not going to hit them (Allie).

Starting with the shared imperative on bike-rider and car-driver to avoid a collision, Allie then establishes another imperative for collaborating on the outcome: the need for a dialogue between rider and driver (see also Figure 6.2, below). Out on the road, dialogue is frequently

problematic. Time is often short, and conventional verbal dialogue is replaced by eye contact, gestures, movements and postures. Reading the car body language, while both are on the move, can be prone to misinterpretations (no doubt reading the bike-rider body language for car drivers can be problematic at times too). For the bike-rider, avoiding collisions relies on clear intentions and actions:

> I think a lot of riders need to be more assertive, but also considerate at the same time; it is a delicate balance ... to be assertive, and that actually makes it better for the drivers, because they don't have to make a decision. Yeah, but you have to try to not hold them up too long (Adele).

Steve also used a mirror for checking traffic overtaking from behind. His practice, though, still included 'head-checking' – turning his head to look for cars coming from behind. He also used small waves to acknowledge driver interactions. Steve felt that seemingly small gestures actually invoked strong human-to-human reactions and connections:

> A bit of obvious human movement, I feel, triggers people's visual cortex more than cyclists [do] (laughter). Because people don't look for bikes … so making yourself look a bit like a human, I think it all helps (Steve).

This idea of unsettling the trope of mainstream driver versus marginal cyclist by humanising encounters emerged in every interview, and was sometimes evident in video footage. These were the small waves, nods and smiles, gestures hard to detect in the videos, but deliberately used in collaborating moments of person-to-person encounters. Steve continued:

> A really important part of keeping myself safe on the road is the goodwill communication with other road users, and I try to make sure that I've got eye contact with people, and I try to acknowledge people with a hand wave. And I think that helps a lot in terms of sharing the road (Steve).

This idea, though put slightly differently, was also echoed by Allie and Erin:

> Like a social interaction all the time! But that is one of the good things about having bikes on the street, you actually [have] a face, and you're interacting with other faces (Allie).

> And going on the bike track, it's very nice but you don't have that sort of social interaction except when you cross the occasional roads. I hadn't really thought about it, but there is perhaps that ... It creates a bit more excitement, perhaps, having that interaction with all the other players on the road. I do like the bike track, too (Erin). [16]

Goffman's systematic studies exploring the underlying structure of everyday interactions highlights similar practices and structures operating largely outside conscious awareness (1967; 1990). The body-to-body starting point for his work was not just about facial expression, but also posture and gestures. Goffman studied the orderliness of encounters in social or street-based interactions. Several ideas recur in these interactional rituals (Smith 2006). For Goffman, face-to-face interactions dominate social life, and are characterised by co-presence. This is about each actor conveying something of themselves in speech and manner. These are the face-to-face interactions, such as eye contact and speech, as well as the more bodily, yet nonetheless expressive, messages given by postures and comportments.

Cyclists relied on eye-contact, often difficult to gauge but no less actively sought for that. They also used hands to signal their intentions, such as changing lanes, but also such crucial indicators as body and bike comportments, plus the speed and direction of their movements. Like the phases of assessing and signalling, posture and gesture establish the co-presence of the parties. Next, the flow of communication is established, facilitated by the opportunities for dialogue. This special mutual co-presence is the collaborating and accommodating phase. For the cyclist, this phase stabilises the mutual goal of avoiding near misses and, above all, collisions.

Out on the road these unfolding interactions can generate runs of communication. While lasting just a few moments, these interactions are intensely important to cyclists, and, presumably, to the car-drivers. The grammar of the encounter is present in the rhythms of moving: *riding lines, driving lines, comportments, speeding, slowing, occupying space, giving space, gestures, indicators, brake lights,* and *timing*. The bike-rider was intent on assembling and staging these opened encounters as smoothly as possible. In looking for an

[16] In this instance, the bike track mentioned is the Hobart Intercity Cycleway, an off-road, pedestrian-shared cycleway stretching from Hobart's northern suburbs to the city. The cycleway follows alongside an occasional-use railway line.

overarching approach to the habits of living – of inhabiting 'lifeworlds' – Seamon developed the notion of place ballets (1979). Watching the videos, there are aspects of place *and time* ballets with key, clear bike-body postures and gestures seen in signalling and occupying space with all the clarity of timing and rhythms. The interactions were actively performed to ensure that communication resonated back and forth. In just a few moments, the encounter was one of co-presencing, collaborating, and then neatly closing off. Closure, the mutual reading of the ending of the co-production, is a key phase in collaborating that is not articulated in Goffman's four stage interactions. Of all the phases, closure was often the most difficult to apprehend, apart from the occasional small gesture of acknowledgement such as a hand wave.

Of the many interactions captured in each video, there were always one or two that needed to be more actively managed, and often these were at intersections. The next section gives three examples of bike-riders and car-drivers working together to avoid collisions. Avoiding collisions is at the heart of these interactions, but what these examples demonstrate are finely tuned interactions producing outcomes beyond simply avoiding a collision. The first example is a fast-paced encounter approaching a busy highway 'feeder' intersection in Launceston. The second is a slow-paced collaboration at a T-junction in the backstreets of suburban Hobart. The last is on a long uphill run on a busy road in the heights of suburban Launceston at the carpark entrance to a takeaway restaurant. The interviews and the videos inevitably foreground the perspective and perceptions of the bike-rider. Collaborating though, is just that, and while drivers were not interviewed, observations (sometimes frame by video frame) of the car-drivers' 'body language' were used in the analysis. Each example shows how 'runs' of actions and communication are produced. How collaborations were wrapped-up, closed-off, or moved-on-from is also considered.

Fast-paced collaborations

Beginning with Allie's words, reported earlier, of needing to avoid a collision by making car-drivers aware of what you are doing (and that what you are doing *is avoiding* a collision), the interview continued with Allie narrating as we watched her heading north on Margaret Street in central Launceston towards the busy York Street intersection (Figure 6.2). The intersection marks the start of the westward-bound lanes of the West Tamar Highway on the left. York Street funnels three lanes of traffic west to the highway and takes much of the Margaret

Street traffic as well. Allie was in the left lane but needing to shift out and into the right lane to continue along Margaret Street. The two cars ahead were turning left, as was most of the following traffic. Allie's lane was about to become left-turn-only, and she needed to move quickly, albeit carefully, into the stream of traffic on her right.

Figure 6.2 – Collaborating on fast-paced encounters (Allie) (Self-videoed, helmet-mounted camera)

The helmet-mounted camera image (Figure 6.2) shows the fluid situation. The two cars pictured were passing and then shifting into Allie's lane to turn left at the lights. The worn paint on the lane divider (bottom of picture), in contrast to the clean white centre line (top of picture), is a likely indicator of the frequency of lane shifting by cars at that point. The image also shows Allie's view as she is about to turn her head to check the following traffic. It is one of a series of head-checks. Each time the footage jumps back and forth, following her line of vision. Her outstretched right arm is momentarily glimpsed during one head-check. Her ride-line is fast, smooth and steadily moving to the right, despite the proximity of the faster cars. Allie's posture, her ride-line and her repeated head-checks helped to establish the run of communication and are illustrated in the accompanying video.

[Video 5 – Fast-paced collaborations]

Her bike-body language can be apprehended by following her head movements and her ride line. Allie's quick head turning and hand-indicating, and her fast, smooth ride-line combined to signal her presence and intention. Allie's words provide clues to the other forms of on-road

communication and collaboration. These were the rhythms, tempo and timing taking place: ‘run of communication’, ‘back and forth’, ‘signals’, ‘quickly’, ‘consistency’, ‘short space of time’. The helmet-mounted camera animated the rhythms of her sightlines. For example, in the bike lane the camera follows Allie’s more relaxed head movements meandering left to look at parked cars, and right to check the car lane. The camera lingers also, for a time, downwards, firstly on a small metal cover in the road, and then on the end of the bike lane.

What is apparent from the moment Allie leaves the bike lane is a change in tempo. Her head movements become more precise, defter and sharper. Initially, the camera holds a steady line of vision, mimicking Allie’s steady riding line. The first car passes. The passing of the second car marks the first of three quick head-turns back and forth to the white utility vehicle (ute) following. The second rotation snaps back moments later, this time with indicating arm outstretched but fingers relaxed as Allie crosses into the right lane. One final half-turn to the right and she is in the middle of the lane with the camera steadily pointed down to the road in the near distance as she enters and crosses the intersection (it appears Allie is also checking on the state of her riding surface). In the midst of the intersection there is one last quick half-turn back, this time to the left, and presumably to check on the left-turning ute.

Slow-paced collaborations

I followed Erin along a one-way suburban street to a T-intersection with a narrow, two-way lane on our right (Figure 6.3, below). Our ride line skirted the speed-hump (frame 1) but also established her intention to turn right whilst staying outside the drive line of the one-way street. A car appeared (frame 2) and was obliged to give-way. It did stop but effectively blocked our path. Attempting to skirt around the car to the right was problematic. Sight lines are poor and there was a chance that we might find ourselves turning into oncoming traffic.

Unlike Allie’s fast-unfolding action, Erin’s journey (with me following behind) was on the brink of stalling (frame 3). Her run of communication was established by three behaviours: a deliberate slowness, steady eye contact, and her arm held outstretched but with fingers relaxed. The language of the gestures, postures and movements to the waiting driver is: ‘I’m wanting to left, I know you’re waiting (patiently) for me but I’m happy for you to go and I’m giving you the space’ (frame 3). The deliberate, slow-paced rhythms and tempos of this encounter become clearer when watching the last of the six videos.

[Video 6 – Slow-paced collaborations]

Runs of communication end but how they end is informative. Erin's ended *immediately* when the car began inching forward. Erin dropped her arm, shifted her gaze from the driver to the laneway and picked up her cadence. This confirmed to the still tentatively turning car-driver that turning was the right decision (frame 4). The two oncoming cars in the final frame validate Erin's caution. Erin talked through how she approached her encounters with drivers:

> It's a really important part of my riding in urban environments. It's [mostly] low speed, there's plenty of opportunity to engage motorists and make it clear what your intentions are, and I am really happy to yield to a motorist if it makes it easier for both of us, or even them. I'm not interested in asserting my right necessarily. It's about sharing the road, being courteous. If it means I have to wait another five seconds, that's fine (Erin).

Figure 6.3 – Collaborating on slow-paced encounters (Erin)

Acknowledging collaborations

The final example is depicted in Figure 6.4 (below) with Steve's narration and my comment and question (darker blue). The rhythms of a steady line and pace established his intent and effort to move past the waiting car quickly. The driver was holding well back with his motor running. His head was discernible through his window and remained steadily turned in our direction as we passed. His stillness signalled his intentions to stay well back. Steve felt comfortable. This showed in Steve's regular, unbroken pace. Steve acknowledged the driver's patience and distance with a small wave (small enough not to be picked up on camera). With his wave, and by returning his gaze the road ahead, Steve signalled the end to their run of communication.

Figure 6.4 – Acknowledging collaborations (Steve)

In these three on-road examples of collaborating, the bike-rider combines their gestures and movement with timing and tempo. Whether the bike-rider yielded to the car-driver or the other way round is not the point. The point is that bike-riders and car-drivers actively collaborate to produce mutually beneficial outcomes. They share time and space, and smooth the way for each other to move with a minimum of resistance and interference. There is much at stake to encourage the bike-riders and car-drivers to engage and cooperate. In each of these examples, though, there are glimpses of something more than just transactional exchanges. Allie and Erin's outstretched arms, assertive yet quite relaxed, and Steve's steady uphill pace and small wave, all point to *what* they were doing, but also to *how* they wanted to share space with drivers.

These encounters are framed by the bike-rider's perspective, but the analysis indicates that *collaborating* is grounded in cooperating rather than in orchestrating or dictating outcomes by the bike-rider. Allie's lane change was orchestrated in front of the following ute, but not before two cars had orchestrated their own fast-passing manoeuvres. Allie's example suggests that collaborating, for bike-riders, is not necessarily interacting with this or that car. Rather, it is interacting with the flow of cars. Thinking not just about individual car-drivers, but traffic flows made up of car-drivers, shifts Allie's encounter to being understood as a much more open and cooperative process of two merging and diverging flows.

Similarly, for Erin's slow-paced encounter, did the stopped car-driver orchestrate the encounter as much as Erin seemed to orchestrate the car-driver's actions? Erin talked about making her intentions known and yielding to car-drivers as a sharing of space. The body language of car-drivers seems to signal the same conversation: making intentions known by staying stopped, being prepared to yield and to share space. What transpired appeared to be a back and forth conversation about how to share that space (see also Figure 6.5, below). The run of communication was cooperative yet open-ended, as each tried to smooth the journey for the other. Steve's example also shows the car-driver and bike-rider co-operating rather than deferring or dictating. The driver of the ute had the time and space to manoeuvre forward in the carpark, and then out onto the road ahead of us. Collaborating, though, produced a different outcome. Steve's words; 'you've left me feeling safer – thanks', sum this up.

Did my presence overly influence either encounter? For Erin's slow speed encounter, I stayed back as much as possible so that Erin was the focus of attention. This became increasing difficult though as Erin slowed almost to a standstill (refer to frames 1, 2, 3 in Figure 6.3). Following along, close but not too close was my usual practice. At times, when approaching traffic lights for example, I would move in closer to stay in contact. For Steve's encounter, I deliberately kept close to blend in, rather than be discerned as a second, distinct (even straggling) entity. My perceptions of closeness through are tied to speed – what felt comfortably close at low speed often felt too close at higher speeds.

Out on the road, these unfolding interactions can generate runs of communication which, while lasting just a few moments, are intensely important to bike-riders and, presumably, to car-drivers. The grammar of the encounter is in the rhythms of movement and moving: ride lines, drive lines, comportments, speeding, slowing, occupying space, giving space, gestures, indicators, brake lights, times, and timing. The bike-rider is intent on assembling and staging these opened encounters as smoothly as possible. There is much at stake, but the communication resonates back and forth – in just a few moments the encounter is one of co-presence(ing), collaborating, and then neatly closing off.

Co-producing

Co-producing smoothed the way for each party to move with a minimum of resistance and interference. There is much at stake for cyclists and car drivers to encourage them to engage and cooperate. In each of these exchanges, though, there are glimpses of something more than just transactional. Outstretched arms could be both assertive and quite relaxed, establishing the tone of the exchange. Co-producing for cyclists was about getting the mechanics of exchanges right, but also about how they wanted to share time-space with drivers. Co-producing was couched in expressing a sort of mature empathy; 'here we are on the road together' (Figure 6.5). Whether the rider yielded to the car driver or the other way around was not the point. The point was the co-producing of runs of communication that could resonate back and forth, resulting in mutually beneficial outcomes.

Road systems designed for and filled with cars, trucks and buses can be considered as more or less hostile environments for bicycles. The bike riders were intensely aware of their vulnerability in such environments. One practical tactic to counter this vulnerability was to become intensely aware of unfolding situations and events. Another was being smooth and predictable and being seen to be so. Actively co-producing collaborative encounters with drivers was another. In all the many videos there were no interactions that appeared intrinsically or wilfully hostile. The opposite tended to be the norm, with the drive lines appearing to skirt around cyclists in an effort to create the widest passing margin possible. Katz' (1999) study of accounts of 'road rage' between car drivers in Los Angles develops a description of an interactional entity that is configured, like the bike-rider, around the hybrid person-thing; that entity is the car-driver. The insulating and isolating effects of the car body touched on in Chapter 1 orient the ontology of the car-driver in certain ways (Katz 1999; Sheller 2004; Thrift 2003). Katz' findings, perhaps aided by the cauldron-like setting of the immense freeways and sheer volumes of traffic in Los Angeles, which are noted to be beyond even those of other car-orientated American cities, highlights distinct patterns of aggressive on-road behaviour. Notwithstanding the smaller city environments of Launceston and Hobart, there was no evidence of road rage across the 55 videos. On the contrary, the videos showed much more cooperative behaviours. In addition, the few accounts of past road rage incidents shared by the cohort appeared to be quite low-key. The participants used co-producing tactics to actively defuse potentially tricky encounters. Sometimes these included small waves and

gestures, acknowledging and reinforcing the safe sharing of space between these two distinct forms of urban travel.

Co-producing synthesises people, things and movements into formations greater than the sum of their parts. Co-producing actively composes people and things through actions, reactions and interactions, enrolling all manner of materialities, flows and forces (Anderson and Harrison 2010; Anderson and McFarlane 2011). Waymaking is constituted in multiple, overlapping cycling co-productions:

> [I]ncessantly looping back and regulating itself through feedback phenomena such as proprioception, resistance, balance, rhythm and tone; put simply, all action is interaction (Anderson and Harrison 2010, 7).

Co-producing invites a shift away from 'individualised subjects of mobility studies toward understanding mobility practices as more-than-individual and more-than-human' (Cook et al. 2016, 2). Cycling in the urban environments of Launceston and Hobart was never a solo achievement. The participants' skills and experiences were evident in their practices of co-producing a smooth, stable ride through their on-road collaborations with car-drivers.

Making journeys: Waymaking

> I mean you sort of take it for granted that you can ride a bike, but not everybody can. And not everybody wants to, obviously. But there are some skills involved. And I mean just little things like going over particular bumps and curves. I just have this little set routine where I get up on my feet for this bit. And it is a bit of a, sort of a bit of a dance on the bike, yeah. A routine, like a dance routine, I suppose (Sarah).

The eight themes developed so far elaborate ways of understanding cycling journeys beyond those of a utilitarian transport focus. This final section synthesises these analytically-informed thematic ideas and details how cycling journeys are produced into an overarching theme: *waymaking*. Waymaking is the ways in which cycling is done and Sarah's talk of the play of dance and the structure of routine is an apt place to begin. Like a dance routine, bike-riding is made up of many sub-routines. These routines can be set to the rhythms of the road, timed with the ups and downs of bumps and curves, or the push and pull of the traffic. Bike-riding is also a contingent, and at times open-ended, set of improvisations, often played out between encroaching traffic and gritty edges. For cyclists, the journey is always being made and remade, on-the-move.

A close reading of the words *way* and *making* helps to situate waymaking. 'Way' is derived from the Old English '*weg*', meaning to move or carry (Oxford Dictionaries 2016). 'Way' also has extended meanings of 'space', 'manner', 'method', 'possibility', and 'want'. 'Making' is a process of producing. Making has the extended meanings of 'building' and 'creating' (Oxford Dictionaries 2016). The notion of waymaking also shares some features with the idea of wayfaring, as argued by Ingold (2011). For Ingold, wayfaring is the process of actively threading ways through the landscape as 'lineal movement *along* paths of travel' (2011, 149, emphasis in original), in contrast with transportation, which is the carrying of people *across* the landscape.

Movement is fundamental to Ravaisson's portrayal of habit. For Ravaisson, through repetition habit transforms its own condition by containing and condensing movement so that over time the activity becomes more efficient and effective. Here, habit, 'skeletalizes action' (Grosz 2013, 221) reducing the effort involved and, in doing so, it creates 'a new bodily mode of existence, the learning of a way of simplifying action'. While habits can also

compact and compound activities into dull, repetitive routines, habits also provide the ability to change tendencies and reorient a person's actions.

Ravaisson is useful for studying cycling practices as a contraction of successive past events, but also as openness to future possibilities, 'the way all movements stretch beyond themselves to condition future movements' (Bissell 2014, 488). Contrary to Cartesian representations of habit as the reduction of action to an instrumental and mechanistic reproduction of existing order, the potential rather than the constraining dimensions of habit are more useful in linking the dynamics of social order with creative possibilities for change (Bissell 2014; Carlisle 2010; Dewsbury 2011; Dewsbury and Bissell 2015; Grosz 2013; Malabou 2008; Sinclair 2011). The work of Ravaisson is increasingly evident in the mobilities field, in studies of walking (Middleton 2011), urban movement (Sharpe 2013), plane travel (Bissell 2015), and the behaviour change needed to achieve low-carbon mobility (Schwanen, Banister and Anable 2012).

The challenge, as Middleton (2011) contends, is in unpacking and developing the often highly abstracted theoretical writings of Ravaisson (and similarly Bourdieu 1977, and Merleau-Ponty 2002). Nonetheless, the complications in exploiting Ravaisson's notion of habit in the activities of everyday cycling are more than compensated by the opportunities thus availed. Particularly important is the way in which habits work at an 'autopilot' level but can snap back to deal with unexpected situations and events. There is what Ravaisson terms a middle ground, where the passive and the active meet, where effort and consciousness recede thereby wearing down or weakening the effect of sensations and the force of effort.

Cycling, it would seem, requires a channelling of effort which appears to diminish (over time) as bike riders become stronger and more adept at channelling effort. With the developing experience of a bike rider 'mobilised' as habit, cycling also appears to become safer, and more rewarding, as health and wellbeing studies increasingly show. There are also ideas of stabilising and balancing of physical and mental effort. The act (or even art) of cycling is deeply intertwined with balance, stability and instability. Cycling is a contingent undertaking where there are ongoing forces at work: some are habituated in the continual practices and exerted efforts of stabilising the bike and rider, and other forces and events (gravity, very slow speeds, slippery roads, errant cars) threaten that stability. There are also

the possibilities of more profound transformations arising out of everyday habits intimated by Ravaisson.

Apparent, too, throughout the eight themes was that implicit in people's everyday routine of getting on their bike – why they cycled today and why they would cycle tomorrow – was a fundamental sense that whatever might occur along the journey, they were confident and capable of dealing with it. *Making journeys: waymaking* relies on a storyboard cartoon, composed, coincidently, from the very last video of the study (Figure 6.5, below, reading top to bottom, left to right). It was filmed in Hobart on a Friday afternoon in November. The ride began in central Hobart. The footage shows Deb travelling to North Hobart. The storyboard sequence is taken from footage about midway through the journey in a bike lane on Argyle Street. The sequence spans just eight seconds.

Figure 6.5 – Making journeys (Deb)

Frame 1 – Patterns of journey making

Deb, in the first frame, talks about choosing Argyle Street rather than the more direct Elizabeth Street. A participant's inbound and outbound routes often differed. Getting to Argyle Street added an extra loop by back-tracking on foot through a busy Hobart block. Looking for the respite of bike lanes, quieter back streets, laneways or footpaths was often at the heart of more macro-scale decisions about finding ways between origins and destinations. The topography of Launceston and Hobart contributed to those choices. Longer but more gradual climbs were preferred on the way home.

The same road, though, could be ridden differently, even in the same direction. I followed three of the participants on consecutive days. Each participant, though following the same

route, rode the streets differently from day to day, perhaps diverting onto a footpath one day because of traffic congestion, and not needing to the next day, for example. From negotiating changing congestion patterns to the puddles on the road appearing after a shower of rain, to the exuberant zigzagging downhill start to Matt's ride – 'I'm doing a bit of skiing down there', – ride lines varied from one ride to the next. These 'meso-manifestations' patterns of ride lines were readily discerned and explained by the bike-riders.

Finally, there were the 'micro-manifestations' patterns of ride lines. Whether it was skirting around metal covers or patchy road, small-scale twists and turns were always taking place. By slowing down the video of Cam riding the same narrow patch of smooth bitumen on consecutive days, two distinctly different ride lines appeared. Until pointed out by replaying or pausing the video, these 'micro-lines' were almost always missing from the conversations. In the same interview in which Mark pointed to his 'meso-line' zigzagging, I pointed to his micro-line practice of skirting around metal covers. 'I didn't even know I did that … just instinctive I guess,' Mark replied.

In reflecting on these patterns brought into lively being by the rich, detailed videos and participant accounts, one of the more lasting impressions is of flow. The micro, meso and macro riding patterns varied within rides and across the cohort, but riding lines seemed to be intrinsically associated with flow. Participants were seen to be smooth and predictable; they flowed in and out of traffic and through roads and infrastructure. The analysis of their accounts also showed that fluidity and flow mattered. Urry (2000) argues that mobility-based metaphors of flow invite important shifts in thinking, opening up all sorts of possibilities for understanding mobility. Social science is increasingly turning to work on the dynamics of fluidity, such as *turbulence* (Cresswell and Martin 2012), *friction* (Cresswell 2014), and the shifts in moving from *laminar* to *chaotic* flow (DeLanda 2002; 2006).

By adopting metaphors of friction and turbulence, as well as flow, new ways of interpreting cycling practices become apparent. For example, there might be unstable, potentially turbulent flows generated by the unwelcome friction of a car passing too close while crossing an intersection (Figure 5.14). Consider, also, the use of flashing bike lights and high visibility clothing as creating visual frictions to catch and hold the eyes of car drivers. For the cyclists, while alert to the possibility of being 'doored' as they rode past lines of parked cars, their eyes and attention were often dragged away from nearby passing traffic flows.

The notion of flow is used in this thesis in multiple ways, but, as with affect, it has multiple meanings. Another interpretation, resonating with this study, describes flow like this; 'the feeling [of flow] when things were going well as an almost automatic, effortless, yet highly focused state of consciousness' (Csikszentmihalyi 1996, 110). Flow is an engaging concept and there is a temptation to label various findings in this study as experiences of flow. Nonetheless, the experiences of flow in the findings, as with those of moving, rhythms, affects and events are now used to consider three ways in which cycling journeys are made.

Frame 2 – Diverging and merging

Of all the bike lanes ridden throughout the fieldwork, those on Argyle Street were the most conducive to cycling. Deb, for example, likes 'to use them'. The bold, single white lines on the left, divide the bike lane space from car parking spaces. 'Dooring' is still a risk, but the Argyle Street arrangement appears to lessen it. On the right, the double lines with the diagonal stripes are a highly visible statement of separated space – the visual authority of traffic lines 'underlined', as it were. Elsewhere, other than on some sections of Sandy Bay Road, bike lanes had just a single white line. The Argyle Street bike lane is surfaced with a green, textured paint in the approach to intersections (frames 4, 5, 6 of Figure 6.5). The bike lane sight lines are good, and the riding surfaces uniform (refer also to Figure 5.13).

The Argyle Street bike lanes are a space where cyclists can, 'zone out a bit' (Deb). The participants were mostly positive about bike lanes. Even the more modest configurations afforded some sanctuary. The issue was not so much *traveling in* the bike lanes as *leaving* them. The lanes disappeared across intersections (sometimes without reappearing), or when roads narrowed. Needing to merge back into the car traffic occurred regularly, and merging into mainstream flows was one of the most problematic issues across a journey. Bike riders relied on becoming much more aware of the immediacy of the encounter and acting in-the-moment, or being in the moment. They tried to be smooth and predictable when merging into the mainstream flow, endeavouring to create as little disturbance between merging flows as possible.

Reading, and *hearing*, the body language of cars are vital practices. Bike-riders relied largely on listening to become aware of cars approaching from behind, but almost universally followed up with visual head checks. Head checking is risky and gives just brief snatches of

rear vision. Deb used a rear vision mirror, but most preferred glancing back. Engine noise, tyres and wind often blend together, making individual cars difficult to detect by hearing alone. The slight surprise registered by Alice while crossing a busy intersection in gusty winds shows an encounter where her usual auditory cues were lost.

Frame 3 – The moving bike-rider

Moving, and at times the absence of movement, showed up in the fieldwork in multiple ways: as travel, routes, intensities and rhythms. There were the well-coordinated micro-movements of muscles, neurones, gears, chains and sprockets involved in steering, balancing, and propelling the bike. These, in turn, produced the forceful effects of speeding, coasting, slowing, and stopping the bike-rider. The fusion of bike and rider was a more or less taken-for-granted achievement throughout the interviews. When Deb said, 'I could have moved with the traffic', or participants spoke of *their* ride lines, the bike was included in their meaning. The co-agential entity of the bike-rider was introduced to the analysis to render this implicit encompassing of technological materials and capacities within participant's sense of cycling agency. When the bike was singled out, it was often for its utilitarian purpose, such as its carrying capacity. What is central to the entity of the bike-rider is not privileging the capacities or affordances of the bike or rider *per se*; it is the hybridised co-agencies of the bike-rider that exceed the simple sum of bike + rider.

In considering the notion of the fused bike and rider, it was the instances when that fusion was less settled that became opportunities to better understand how bike riding is achieved. The fused or meshed form is achieved through movements and moving. The bike-rider achieves form and agency as a moving co-agent but one that is created by the rhythms of riding a bike – by the cadences, comportments, breathing and balancing that entails. The affordances of Deb's electric bike, the only electric bike in the cohort, can also be thought of as helping to stabilise the bike + rider into the bike-rider. Deb's electric bike helped her to ride through the hillier sections of North Hobart. It gave her the extra confidence to move, when needed, with balance and speed out of 'tricky situations' (Deb). The sophisticated, 'pedal-assist' motor and controls help produce a ride that appeared like any other in the study, but with the added 'zing' afforded by having, for example, the wind at your back or riding down a slight downhill. In the face of tricky situations, or riding with loaded panniers, or

climbing the hills of Hobart, the co-agency of electric bike and rider helped in stabilising the co-agential entity of the bike-rider across the journey.

Journeys produced a multitude of rhythms and, in turn, rhythms shaped journeys. The fieldwork brought into sonorous presence the cadences of pedalling, changing gears, and rattly equipment resonating to combinations of surface textures and movement. There was the pleasurable feedback of these spatio-temporal rhythms and sensations of riding as Pat talks about; 'I'm just enjoying the … how am I spinning?' (Figure 4.6). There were the riding rhythms of surface interactions, the endless weaving and looping of riding lines. Occasionally, the deepening rhythms of my breathing echoed my efforts to keep pace with my participants. There were encounters with the planned rhythms of street grids, traffic lanes and traffic signalling, coupled with the topographical rhythms of Launceston and Hobart, and all inducing the changing rhythms of effort and ease, of slowing, speeding, coasting and stopping. And there were the rhythms of traffic flows, and the accompanying rhythms of changing intensities of awareness, of visually scanning and head checking.

The rhythms produced out of everyday urban mobilities are increasingly seen as empirical resources for generating understandings of mobile time-spaces (Edensor 2010; 2014; Spinney 2010). Henri Lefebvre's book *Rhythmanalysis* (2004) is a usual starting point (Crang 2001; Edensor 2010). Lefebvre writes of the embeddedness of rhythms in everyday life: 'Everywhere where there is interaction between a place, a time and an expenditure of energy, there is rhythm' (2004, 15). Notwithstanding that interpreting the rhythmic nature of mobility has received very little attention, Spinney's work shows that rather than viewing urban cycling rhythms as resisting the 'official' car-orientated road rhythms, difference arises from a different orientation to the 'material and immaterial affordances of the urban environment' brought about by the affordances of the hybridised bike-rider (2010, 119).

Cycling is a contingent and continuous achievement. Achieving and sustaining balance is fundamental to riding bikes. But staying in balance – the always-present rhythmic improvisation of bike and rider movements, comportments, physics and forward momentum – was hardly talked about. Balancing was a taken-for-granted achievement, lost in the more pressing discussions of roads, cars and traffic. Though overlooked in mobility studies, and apparently by cyclists themselves, balance is a metastable combination of rhythms needing to be continually improvised, requiring of attention. The metastable rhythms of continually

balancing orientate the urban cyclist to road spaces in ways which are quite different from those used and experienced by car drivers and pedestrians. The bike-rider is much more vulnerable to the imminent, arrhythmic and potentially disastrous consequences of losing balance and stability.

Frames 4, 5 and 6 – Imminent disruptions

As Argyle Street approaches a signalised intersection, the bike lane and adjacent car lane take on different forms, becoming a space of transition where the car lane *crosses* the bike lane (Figure 6.6, below). The lane becomes a distinct space, with green-painted pavement bounded with dashed white lines, before it straightens up. The layout (as shown in Figure 6.6), *announces* and *configures* these crossover spaces.

Figure 6.6 – Crossover spaces (Argyle Street, Hobart) (Image from Google Maps)

The storyboard (Figure 6.5) frames 4, 5 and 6 show a car giving way. The car can also be seen slowing and indicating in frames 1, 2 and 3. The car is also maintaining a wide distance from the bike lane, with tyres running almost on the next lane divider – drive lines were often as far to the right as the lanes allowed. As both car and bike converge on the intersection, the car slows and almost stops, still giving the bike lane a wide berth and still indicating their intention to move left. Deb notices and turns, looking for eye contact. She briefly waves, acknowledging the space the driver is giving her. The driver waves back. Deb moves on, yet keeps checking in her rear-view mirror. Bike-riders approached such encounters collaboratively. Moreover, in being on the road together, and in sharing moments and places together, there was often a 'sort of empathy' (Deb) developed between rider and driver. The profound difficulties arising from continually trying to negotiate every on-road encounter

with an ‘us and them’ attitude would make sustaining a regular practice, month in and year out, all but impossible. The line between bike-rider and car-driver was never clear-cut, either, as almost all the participants were, at times, car-drivers.

Disruptive events can be considered in different ways, but all are shaped to some degree by chance. Events come and go but leave people and situations configured differently (Anderson and Harrison 2010). Events need to be understood as contributing to the emergent qualities of practices, holding the possibilities of both desirable and undesirable outcomes (Cresswell 2010; 2013). The findings showed that cyclists were aware, indeed at times intensely aware, of the possibilities of being caught up in disruptive and destabilising on-road events. They sought ways of subduing the potentialities of these unwelcome encounters by being smooth, predictable, and by collaborating.

An event is understood here as a marker of change (Anderson and Harrison 2010), and as such appears to be intrinsically tied to differing degrees of affect. For example, occasionally everyday events can surge into affective spikes, as Stewart writes:

> They [ordinary affects] have to be mapped through different, coexisting forms of composition, habituation, and event. They can be ‘seen’, obtusely, in circuits and failed relays, in jumpy moves and the layered textures of a scene. They surge or become submerged. They point to the jump of something coming together for a minute and to the spreading lines of resonance and connection that become possible and might snap into sense in some sharp or vague way (Stewart 2007, 4).

The participants’ recollections of eventful encounters with *that* pothole or *this* section of rough road lay in their memory of some intense spike of affect, which snapped into (and had presumably therefore been mapped onto) their conscious memory in some sharp way. Deb’s encounter with the driver of the black sedan was a potential disruptive event that became something else.

Frames 4, 5 and 6 show how the escalating uncertainty of approaching the crossover space is smoothly negotiated by the bike-rider. Like the footprints set out on a dance floor to guide beginners (and to remind the more experienced), the infrastructure guides the converging traffic up to and then through the intersection (Figure 6.6). The dashed lines and green surface signal the orderly possibilities of the space. Even without a detailed knowledge of the

road rules, the markings are clear enough indications of the spacings and timings. Less clear, though, are the affordances of the road surfaces, and their vital part in ordering and smoothing ambivalence.

The possibilities of becoming unstable, as much as the possibilities of *remaining* stable, are shaped in crucial ways by surface interactions. The importance of riding surfaces became clear in the visual and auditory camera instabilities found in the *shaking, rattling* theme. The Argyle Street bike lane is free of the disordering possibilities of surface bumps, cracks and discontinuities. While the bike-rider might consider this surface smooth, at another, more fine-grain level, the coloured pavement surface is deliberately textured. This helps in stabilising bike riding by increasing tyre grip, thereby decreasing the risk of disruptive slippage that overly smooth surfaces cause. As much as roughness on the scale of bumps and potholes can destabilise, roughness on the scale of the paint texture helps stabilise a ride.

The less felt and barely apprehended haptic sensations in the *shaking, rattling* theme lay very much in the background of participants' accounts. While an event is generally thought of as a significant spatio-temporal occasion, happening or milestone, another possibility becomes apparent by reading an event as more subtle and 'stretched'. In this reading, an event is apprehended as a series of small occurrences over time and in space; 'a continual differing, if only in modest ways' (Anderson and Harrison 2010, 20). For the cyclist routinely travelling over seemingly immutable road surfaces, the event might be the changing wet-dry surface conditions from one ride to the next, or the asphalt slowly deteriorating and breaking up from one year to the next.

The micropolitics of everyday travel

Waymaking is the interplay of many things, and not least the events and encounters enabling and constraining everyday travel. Urban travel is collectively shaped through a myriad of on-road cyclist and driver interactions, which can be understood as small time-space performances of power in the wider constellations of Cresswell's politics of everyday mobility (2010). The sheer volume of co-produced events and encounters found in the study can be interpreted as an ever-present, micropolitical shaping of cyclist-driver relationships. As Bissell points out:

> A micropolitics of mobility is concerned with how an event's openness comes from multiple forces that are immanent to the event itself. So rather than orienting analysis around rigid lines of longer durational social formations, a micropolitical focus encourages us to evaluate how the moment-to-moment transitions in power can disrupt, or indeed strengthen, these more rigid lines (Bissell 2016, 400).

What do the mobile practices of balancing the rider and the ride, of intensifying awareness and collaborating, hold for thinking about on-road politics? Their smooth, predictable riding lines flowing in and out of mainstream flows revealed the cyclists to be intent on making their way with minimal disruption. The tone of the on-road interactions among car drivers and cyclists, too, showed that from the bike riding perspective, these were co-productions, at times assertively enacted, but always actively orchestrated to unfold as seamlessly as possible for both parties.

Bike couriers, it would seem, exhibit very different practices from the participants in this study. Bike couriers (or bike messengers) are people who carry and deliver documents by bicycle in busy, traffic-dense city centres. A portrayal of bike couriers paints their cycling mobilities as fast, exciting, risk-taking, and at times dangerous (Kidder 2011). According to Kidder, bike couriers often push their skills to the limit in what he terms 'edgework'. They dart in and out of traffic in opportunistic and sometimes disruptive ways. Door-to-door delivery speed is essential, and is said to drive 'the courier's disregard for traffic laws' (Kidder 2014, 320). Although other studies portray bike couriers as part of a more restrained culture (Spinney 2014), the mobile micropolitics of Kidder's bike couriers illuminate those found in this study. While communities of practice such as messengering enact, in part, a micropolitics of pushing up and even disrupting the mainstream, everyday bike riders were more intent on avoiding disruptive events by blending in with the mainstream or inhabiting the margins.

The work of transforming cycling is frequently associated with the politics of cycling advocacy, and of the activism of grassroots organisations and movements (Mapes 2009; Wray 2008). The focus is on (re)asserting the place of cycling as a much more mainstream means of urban mobility through conventional, macropolitical means and structures. A central theme of these politics is the many social benefits of cycling. Implicit in these agendas is the work of unsettling the mainstream social, cultural and political nature of the motor car,

which ‘serves as a metaphor for a culture that, one way or another, is dying’ (Wray 2008, 220). The bike, meanwhile, is ‘seen as a metaphor for a new era’ (2008, 220). However, Bissel points out that by overlooking the micropolitics of mobilities through subject-centred approaches, there is a risk of underplaying ‘the very transformations that mobility practices such as commuting themselves actually give rise to’ (2016, 394). Amin and Thrift also note the importance of ‘a whole politics of embodiment, from the minutiae of gesture to the movement patterns of the crowd’ (2002, 158). They continue:

> Much of what goes on in the everyday spaces of the city is not about participation in politics with a conventional capital P. Rather, it is about new kinds of molecular politics which vie for public attention, sometimes succeeding in creating wider social and political effects (Amin and Thrift 2002, 158).

At first glance there appears to be little potential for social change, let alone transformation, in the mobility practices of everyday cyclists. In reflecting, though, on the micropolitical implications of bike messenger practices and their often negative profile with the wider public (Kidder 2011), along with the macropolitical agendas of activism and advocacy, the sense of an expanded, affirmative cycling politics emerges from the everyday on-road micropolitical interplay found in this study.

The everyday power of cycling practices in Launceston and Hobart lies not in events of disruption, such as messengering, nor in the work of advocacy and activism, but in a different set of rhythms working yesterday, today and tomorrow in the interstices of entrenched mobilities. Power lies in the skills of fluidity and flow, the ability to smooth and shape riding lines to flow among and with cars, just as drivers subtly reshape their driving lines to flow around slower bikes. Power lies in the on-road capacities of bike riders in sharing (taking and giving away) time-space. Power lies in orchestrating runs of communication, in small waves, gestures and acknowledgments, in skilled practices of using intent and tone to express a sort of empathy – ‘oh, here we are on the road together … you’re letting me go, that’s nice’ (Figure 6.5). This is not the disruptive cutting and weaving of Kidder’s bike messengers. The power of the micropolitics of practices is, in Anderson and Harrison’s (2010) second reading of an event, the slow-creep, stretched event of continual differing in small ways. The power of everyday cycling waymaking in Launceston and Hobart lies perhaps not in disruptive

events but in a slow-burn *event of disruption*, a transformative event every bit as crucial to changing entrenched mobility habits as the macropolitics engaged in by others.

Waymaking: moving on

The idea of waymaking, *the way in which cycling journeys are made*, was generated out of the eight themes and ideas set out across the three analytically-informed findings chapters. Waymaking shows how cycling coalesces across a journey, and how, in the midst of this daily mobility, waymaking habits exceed the sum of these somewhat set routines and the often taken-for-granted skills of bike riding. Two key exemplars of waymaking are set out in the following and penultimate chapter, Chapter 7: Lines of Desire and Surface Affects. Like the nine themes discussed so far, Lines of Desire and Surface Affects is an analytical combination of theoretical resources and empirical findings.

Chapter 7 Surface Affects and Lines of Desire

The analytically-informed themes of the findings chapters, *moving moments*, *moving places* and *journeying*, show how everyday cycling practices gather together temporal, spatial and bodily phenomena. These themes, or ways of making journeys, were synthesised through the idea of waymaking. Put simply, waymaking is *the way(s) in which cycling is done*. Waymaking was found to be a contingent process, never quite stable, always in the act of being made whilst always threatening to become unmade, but cohering to enable journeys to be made by bike. Waymaking is understood as a generative assemblage of mobility practices that exceed conventional, utilitarian-based understandings of city cycling summarised in this thesis as cycling-as-transport.

This chapter is used to develop two key exemplars of waymaking by bringing together several themes. Each exemplar narrates and animates cycling mobility in particular ways. Together they illustrate cycling practices in ways that demonstrate that cycling is much more than just an instrumental encounter with the city. The first, Surface Affects, draws together the *riding surfaces* findings and those of *shaking, rattling*. Surface Affects explores the mostly unnoticed yet highly affective nature of surface interactions. The second, Lines of Desire, uses *riding lines* most directly, but also the habits and practices of negotiating urban time-space found in *fused to the bike*, *infrastructures* and *riding surfaces*. Intriguingly, both exemplars are born from the thumbprint-sized contact of bike tyres with riding surfaces. In exploring the interactions generated across this small but nonetheless crucial interface, the two exemplars illustrate the value of improving our understandings of city cycling by attending to the largely overlooked aspects of riding surfaces and riding lines.

Exemplar 1: Surface Affects

> So much of life occurs at the surface that, as students of the human scene, we are obliged to pay far more attention to its character (subtlety, variety, and density) than we have done. The scholar's neglect and suspicion of surface phenomena is a consequence of a dichotomy in western thought between surface and depth, sensory appreciation and intellectual understanding, with bias against the first of the two terms (Tuan 1989, 233).
>
> Mobile methods, then, could be utilised much more than at present to understand the 'vibrant materialities' and mobilities of the world … whilst acknowledging the fact that

> things move and vibrate with different rhythms, speeds and affects (Merriman 2014, 178).

Surfaces do matter, but researching the 'depth' of a subject is generally held in higher regard (Forsyth et al. 2013; Tuan 1989). For example, the discourse for exploring phenomena encourages researchers to look beyond the superficial and shallow for deeper understandings, to uncover, excavate and disclose underlying meanings. By digging deeper and not just scratching the surface, academic inquiry can get to the heart of the matter. However, much of everyday life takes place on surfaces. Surface phenomena certainly matter, and sometimes in unexpected ways, for bike riders. Road surfaces are largely overlooked sites for investigating aspects of cycling practices. Knowledge of the interactive affects and effects of surfaces and cycling mobilities has implications for cycling safety, amongst other things.

The ongoing encounter the participants had with their riding surfaces was a mostly low-key affair. The capacity of the tiny contact area of bike tyre on road pavement to maintain the crucial material connectivity between bicycle and riding surface is a routine cycling accomplishment, and was frequently taken for granted by participants. Perhaps unsurprisingly, it was the more noticeable encounters and interactions with cars and traffic which occupied participant's concerns, rather than the ever-present and taken-for-granted interactions with road surfaces. Furthermore, as a researcher wanting to consider all types of interactions for interviewing and analysing, I largely overlooked cycling interactions with road and footpath surfaces until my sensibilities became more attuned to the 'vibrant materialities' of cycling mobilities. Just like Jones (2005), Spinney (2006) and the experienced cohort of participants, cycling surfaces were of an absent-present nature as argued in the theme of *rattling, shaking*. It was easy to factor out the influence of riding surfaces on the act of bike riding. For example, my rationale for avoiding wet weather filming was mainly due to my concerns with the distorting effect on the footage of raindrops lodged on the camera lens, rather than any risks posed by riding on slippery surfaces.

'Surface affects' is the first of the two exemplars of waymaking. The notion of surface affects draws on several manifestations of cycling surface 'life' evident in the findings. There was the unexpected, persistent and sometimes exasperating encounter with camera noise, which was developed into the *shaking, rattling* theme. Then, there were the urgings of Adey at al. (2014) not to ignore noise but, in fact, to investigate instances of mobilities research noise.

Finally, there was the unexpected intensity of responses, reported in the theme of *infrastructure* when participants pointed out potholed or poorly maintained sections of road in their ride videos. Participants also talked about their past encounters, such as a misdirected ride line over a pothole, a loss of traction on gravel, or a slide on black ice. The chance of a sudden and destabilising crash event paints a somewhat dark picture of the possibilities of surfaces interactions. The findings also showed how surface roughness, smoothness and undulations operate in lively, dissonant conjunction with the bike and rider. And while Tuan's account of surface phenomena moves to a visual-aesthetic register, I also contend that, in being more attuned to 'living at the surface' (1989, 234), we can gain an expanded understanding and affirmation of the place of surfaces in the mobile practices of cycling.

Riding surfaces are an ever-present and all-important matter for cycling, but are curiously overlooked in research, as demonstrated by the absence-presence of surfaces in Chapter 5. Beginning with a reflection on my encounters with the research noise, an account of surface affects is advanced using the notion of haptic sensations. Haptic sensations are the felt kinaesthetic sensations of movement combined with the tactile sensations of the ride. Haptic sensations are 'felt' through vibrating limbs as much as hands, feet and seat-of-pants. The account draws on Rodaway's (1994) 'haptic geographies' to advance the possibilities for engaging with the changing affective intensities found in haptic time-space mappings. Finally, the opportunities of engaging with surface affects across the realms of cycling practice and transport research are explored.

Haptic geographies

Noise is usually understood in pejorative terms as the din or racket of an unpleasant disturbance. Noise also brings to mind the understandable, impulsive responses of containing or eliminating it by reducing, filtering or cancelling. In this study, the shaking, rattling and jolting audio-visual video noise from the very first follow-along ride was a hard-to-ignore disturbance, and intruded, to some extent, into every video sequence. On one level it was irritating, but the pervasiveness of low levels of bumping and jolting in every ride showed the extent to which such very familiar sensations – haptic sensations which underlie every moment of every ride – are automatically accepted and overlooked.

Haptic sensory awareness relies on two distinct faculties: the sense of touch (which picks up the tactile sensations of literally 'being in touch' with the environment), and the ability of the body to perceive the position and movement of its parts relative to one another through sensory organs (proprioceptors) in the muscles and joints. The ability to perceive the position and movement of body and limbs is known as kinaesthesia (Paterson 2009). According to Rodaway, the haptic system is a combination of these two forms of sensory awareness:

> Here, 'haptic' refers to the tactile receptivity of the skin, the movement of the body parts and the locomotion of the whole body through the environment (Rodaway 1994, 42).

Rodaway further describes haptic experiences as part of a 'wider multisensual geography and a kind of foundation for such a geography' (1994, 42), then extends this notion of the haptic system to the bodily encounters and interactions with place and space in what are termed 'haptic geographies'.

Haptic geographies bring together the active sensations of touch as intertwined 'in the perception of space and relationships to place' (Rodaway 1994, 42). Haptic geographies are a key approach for exploring the surface interactions of cycling. It needs to be noted, however, that Rodaway uses the term 'tactile' to refer both to touch as tactile sensations, but also as 'being in touch' with motion, in the sense of kinaesthetic sensations. Vibrations, too, are detected through sensory receptors (mechanoreceptors) responding to mechanical pressure (Paterson 2009), and while Rodaway makes no mention of sensing vibrations, the notion is subsumed into haptic sensations and geographies. Thus, the bumping, jolting, reverberating haptic sensations of cycling are combinations of vibration-sensing, kinaesthesia and touch. Also, the perception of the temporal 'pace' of the rhythms of locomotion is a factor in understanding the haptic geographies of cycling.

To be sure, surfaces do matter, but it is very likely that the banal pervasiveness of paved surfaces contributes to their absent-presence in the haptic experience of bike riding. Rodaway also points out that haptic geographies 'are often overlooked, since the tactile experience is such a continuous and taken-for-granted part of the everyday encounter with the environment' (1994, 42). Further, while video research highlights fleeting and ephemeral moments which can be overlooked in more static accounts, the very analysis of video can become preoccupied with looking for those *here now, and then gone* moments of action. The always-present haptic encounters with the here and now of pavements in plain sight and feel

are all too obvious. Viewing familiar cycling corridors with the overlay of the shaking and rattling reproducing (and sometimes amplifying) surface textures may have sensitised and helped to cue the visceral responses to the rougher sections of road reported in the findings. It was this sensitivity of participants to extremes of roughness and smoothness which helped to 'map' the intensities of haptic geography.

The haptic geographies of very rough and very smooth surface textures may be felt differently, but both can very quickly destabilise the bike and rider. For cycling mobilities, surface texture can be considered a source of friction in both the mechanical sense and as a lived and felt phenomenon. Cresswell separates the realm of material friction from that of cultural or social friction. Cultural or social friction occurs when, for example, 'you are stopped while driving though a city' (Cresswell 2014, 108). Easily separating the two, though, is more complicated than it appears in this example, as stopping a car also involves the material, mechanical friction of the vehicle's brakes. In the present study, social and material frictions were seen to be much more interwoven. It was the danger of too much jolting friction overcoming the stability of bike and body, or the equally unnerving *loss* of friction with a slide on gravel or ice, which was palpably felt and shared again and again by the participants. Between the extremes of surface conditions exists an array of surface geographies affording enough friction for gripping and steering without slipping. It is these surfaces which the bike and rider exploit in their everyday, taken-for-granted haptic encounters. There were times when haptic encounters shifted to more conscious registers as enjoyable experiences enhancing the ride. As one participant related, the sensations of riding on smooth (but not overly smooth) textured surfaces *and* of (artfully) avoiding rough sections were equally rewarding.

When re-examining my own encounters with the haptic geographies of cycling, I became aware of how reassuring it is to feel, and hear, the rhythmic presence of pavement textures. It was a regular, rhythmic encounter telling me that all was well with the road surface and the bike, as distinct from, say, the more arrhythmic sounds of a loose component becoming progressively looser. These small felt and heard vibrations, while not necessarily comfortable, were, in a sense, comforting. In a similar vein, Delyser writes of pioneer women aviators attuned to sensing engine arrhythmias (Delyser 2011). As Bissell has it, '[v]ibrations remind us that we are moving, how we are moving and how fast we are moving' (2010a,480).

Cycling over cracks, bumps, dips, folds, loose stones and rougher bitumen induces a series of low-level reverberations in the bike which quickly decay away (Wilson 2004). Reverberations caught on the handlebar-mounted camera allude to the tactile and kinaesthetic reverberations felt through hands, feet and the seat of the pants. While there were times when the vibrations 'captured' on film were overly amplified, and others when they were largely suppressed, reverberations are still a useful representation of the haptic geographies of the ride. Like the shaking of the camera, the bike's rattling was a record of the ride. The rattling rhythms of the ride, combined with the array of more recognisable cycling sounds, such as bike chains turning, gears clicking, cars passing, and, at times, my own breathing, added to the auditory realism of the audio-visual record.

The everyday rhythms generated between bumpy roads and the rattly bike-bits are more than a simple 'chattering dialogue' between bike and road surface. These road rhythms are modulated by variables such as speeds and riding lines, by tyre pressures and riding positions (Wilson 2004). While this was, in a sense, an unstable scattering of motion, it was persistent and rhythmic. Vibrating road rhythms, rattling both the bicycle components and the haptic sensations of the rider, exist as manifestations of a mostly unnoticed, background white noise of cycling. Nonetheless, vibrating riding rhythms exist as a constant source of affective experience outside my (and presumably most cyclists') conscious sensory awareness. In recounting his experience of hundreds of hours of train travel, David Bissell concludes that the taken-for-granted vibrations of carriages in motion live on as his most enduring recollection:

> Yet in reflecting on my experiences of railway travel, it is still these smaller vibrations that remain one of the most significant aspects of the experience of dwelling in technologies of transit and that perhaps hold the key to thinking about the material relations that constitute both passenger and railway carriage whilst on the move in ways that do not reduce either to a priori, inert phenomena (Bissell 2010a, 485).

Considering road riding rhythms as a conversation of many parts, or as background white noise, both helps and hinders thinking about the haptic geographies of the cyclist. According to Ingold, in western cultures the visual and aural senses are privileged. Of all the senses, people are most attuned to 'hearing sounds, and see[ing] things', at least on a more conscious level (2011, 243). Seeing and hearing tend to work over longer ranges than the other senses.

Things can be detected much farther away by sight and sound than they can be felt through haptic sensations (Rodaway 1994). To that extent, participants relied on seeing and hearing motor vehicles well outside the immediate range of their haptic geographies. Nonetheless, as Tuan relates, when deprived, even in a small measure, of the haptic sensitivity of, say, touch when trying to 'tie a shoelace with frozen fingers' (1993, 43), the realisation of the centrality of haptic sensations to perception is swift. For cyclists, their haptic systems keep them literally in touch with the ever-changing surface geographies. Haptic geographies tune cyclists into the important riding rhythms of surfaces.

Grounding surface rhythms

> Physicists, engineers, designers, architects, physical geographers, and others have focused a lot of energy on understanding the complex processes occurring at the interface of such materials and surfaces, and human geographers are increasingly rediscovering such surface phenomena as friction and turbulence – whether literally or metaphorically (Forsyth et al. 2013, 1017).

The rhythms of haptic geographies are a way of identifying the characteristics of place, 'for rhythms are essentially dynamic, part of the multiplicity of flows that emanate from, pass though and centre on place, and contribute to its situated dynamics' (Edensor 2011, 3). This final section, to consider how reading surface rhythm and arrhythmia, interspersed with friction affects and effects, builds a more complete picture of the timing and spacing of cycling.

The findings showed how surface sounds captured in the NVivo audio trace could be interpreted as a dynamic visual representation of the surface rhythms structuring the ride. The patterns of mostly low-level, undulating reverberations were at times mixed with the spiky jumps of more bouncing, jolting surface conditions. The riding patterns trace out the compilation of the moment-to-moment rhythms across a ride. These patterns show the changing haptic geographies encountered when riding through back streets, along main roads, on footpaths or on bike paths. Edensor considers journeys as having 'a particular rhythmic shape' (2011, 6), disclosing a sense of each journey's mobile time-space. The rhythmic shape of any journey of course relies on multiple sources and structures of rhythm, of which surface rhythms are just one.

The findings also highlighted two factors constraining cycling on footpaths. These are argued here to be forms of kinetic or movement-friction.[17] The first was the presence of pedestrians. Cyclists slowed down when giving way to pedestrians, or when anticipating their unseen presence around 'blind' corners. The second, and the focus of this section, was the rougher surfaces of footpaths, often readily visible in the videos as undulating or patched surfaces, and the spikey outbreaks displayed in NVivo. Here was a source of rhythmic movement-friction, rattling haptic sensibilities, and ultimately constraining and slowing cyclists. There is both a literal and a metaphorical reading to surface movement-friction. This friction is a product of mechanical movement and interactions, but also of surface rhythms, vibrations and felt affects. Cresswell's (2014) mechanical-material frictions and human-practice frictions are hard to separate in these encounters. Latour's example of a speed-bump designed to slow motorists near a school shows the uncertainty that 'makes the tracing of social connections especially tricky once you begin to add nonhumans to the list of bona fide social ties' (2005, 77). There are multiple social *and* material connections to be found in even the most matter-of-fact surface rhythms.

What has been missing from this discussion so far is the second part of the *surface affects* title – that is, the haptic sensations of affects. The notion of affect was introduced earlier as elusive and challenging to research and represent, but also as increasingly important to human geography research. What I explore here are surface affects, but also affects modulated through differing intensities of surface rhythms. Massumi (2002) and Thrift (2004) have linked affect with the changing intensities of amplification and damping. Bissell (2008), in exploring the often complex nature of these desirable states, has linked affect to quiescence and comfort. Three events of affects, rhythms and surface encounters are considered in turn though the lens of affective intensities.

The first was the free and absorbed state where cycling surface rhythms were certainly felt, but experienced outside conscious awareness. This state is intrinsic to cycling, where affective rhythms are always present as taken-for-granted sensations. It is perhaps an absence

[17] There is arguably a third form of footpath movement-friction constraining the cycling space which did not appear in the findings as such – this might be understood as 'side-friction'. The videos often show footpaths as narrow ways between trees overhanging from household gardens and nature strips. In built-up areas, there were signposts and shop frontages, perhaps constraining cycling in a similar fashion.

of sensation more than its presence that is perceptible. This absence was the usual state of cycling, and only apprehended in this study in the form of ever-present, low-key camera noise. There were also times when rhythms, and, very likely, the affective sensations, became livelier. On footpaths, and even on dedicated bike paths, riding rhythms intensified and bike riders reflexively slowed their riding tempo. These can be thought of as close encounters with the '*praesentia* of a place, which is both present and absent' (Hetherington 2003, 1933). In his paper on spatial textures, Kevin Hetherington interviewed a woman whose encounters with art objects were through her hands. Hers was a skilled capacity for nuanced touch and feel acquired over time. Her haptic encounters gave rise to experiencing these objects quite differently from the usual visual encounters had by others. Hetherington asked of her, 'when you are touching something, what are you trying to get from it?' She replied:

> I don't try and get anything … When I am touching there is no "me" and the object I am touching … The way I touch is an identification with something somewhere inside of you, you have got a relationship with it (2003, 1924).

There is, it seems, a similarly confident, knowledgeable and reassuring state of active cycling 'knowing' that is present in the first two events. In each case, road pavement surfaces were both present and absent. The affective encounters worked largely outside conscious registers, but were always reassuringly to hand. Thirdly, and finally, there were the rare occasions when rhythms became so agitated that affects spike up to be transformed into feelings and even emotions. For the participants, these were past encounters in which background surface murmurs had momentarily intensified, surging into conscious registers to be mapped into hard-coded memories of past encounters with 'deadly' or 'nasty little' bumps.

By linking the changing intensities to the reproductions of surface rhythms traced out in NVivo, a new haptic mapping of cycling surfaces has been explored. While it is the more intense affective encounters which register, ultimately surface affects, it can be argued, provide reassuring and affirming encounters with road pavements. Intensities of affect are important to the extent that 'intensity will be equated with affect' (Massumi 2002, 27). Massumi continues: 'Emotion is qualified intensity … It is intensity owned and recognised' (2002, 28). Even spikes in rhythms should not automatically be interpreted as this or that affect, feeling or emotion. Cate's talk of avoiding the unpleasant jolt of a small but deep hole in the road can be contrasted with her practice of jumping off kerbs (two) as part of her route

home. While never talked about as such, it would appear that this experience was one of; 'high kerbs where you can jump your bike off to land with a satisfying jolt' (Jones 2005, 827).

The nature of affects, feelings, emotions, encounters, intensities – the ordinary affects of an affective life – are elusive and difficult to research. But affects matter, and surface affects matter for cycling; as Anderson writes: 'What is shared across diverse affect theories is a sense of urgency, the sense that understanding the dynamics of affective life matters for how geography relates to life and living' (Anderson 2014, 7). Whether walking down familiar stairs, or waymaking in familiar streets in Launceston and Hobart:

> Like accomplished mountaineers we do not even have to look for our regular handholds. And we certainly do not have to do representation in advance of our traverse; there is no need for a map. But if we do look what we find is the patina of *praesentia*'s confirmation (Hetherington 2003, 1943, emphasis in original).

Experiential haptic geographies and the ongoing generation of affective surface rhythms keep bike riders grounded in their matter-of-fact, absence-presence encounters with the moving moments and moving places of road surfaces. In this way, the bike-bound cyclist is grounded to the earth just as much as the car-bound driver and the earth-bound pedestrian – it is just that the affective experience would seem to be so much different.

The only other substantive qualitative investigation of the nature and relationship of surfaces to cycling is Brown's 2016 paper highlighting the role of terrain in encouraging regular off-road exercise. Brown develops the term ground-feel in describing how interactions with the organic textures of natural terrains produce pleasurable sensory and emotional experiences for mountain bikers (and walkers). Whether using the term developed for this study, surface affects, or Brown's ground-feel, both shift perceptions of cycling beyond visual registers to haptic ones, and beyond the binaries of smoothness and roughness. Ground-feel, though, arose from an investigation into the recreational pleasure of biking and walking in nature where the highly changeable nature of the ground might be expected to figure highly in the thoughts and recollections of participants, and, indeed, in their choice of this or that trail or track. I too found surface affects to be no less relevant and interesting but much harder to investigate without resorting to the experimentalism of interpreting NVivo-based graphical traces.

Surfaces do matter

For the participants, surfaces did matter, but the riders typically represented surface matters in the language of roughness and smoothness. Other felt affects were sometimes implied but proved exceedingly difficult to interrogate. For one participant, there was the hint of regret in a reflection on the resurfacing of a particular road previously covered in lichen and moss: 'I used to really like riding along [it], that was so much … I mean there was a lot of lichen'. What was left unsaid? What exactly was meant by really liking to ride along it? This was an affirmation of riding on the textured road, but in what sense? It certainly wasn't slippery, further questions established that much. Was it tied to that particular setting, the narrow, one-way street, the towering trees, the ivy-covered bank and the row of cottages? Was riding over lichen and moss suggestive of a more readily imagined experience of walking through a mossy glade? Moreover, as Brown points out, the very qualities of surfaces that might produces more interesting, even delightful sensory interactions are an 'anathema to the modernist drive to smooth off and standardise surfaces to make them inert and predictable' (2016, 7). Surfaces mattered to city cyclists beyond the qualities of roughness and smoothness but these qualities defied verbal representation.

In proposing, 'an analytic attention to the charged atmospheres of everyday life', Stewart writes that such atmospheric attunements require 'a kind of haptic description in which the analyst discovers her object of analysis by writing out its inhabited elements in a space and time' (2011, 445). This exemplar is that kind of haptic description, aiming to sensitise readers to spacing and timing rhythms of riding surfaces. However, in the hybridised cartoon-style graphics of this thesis, Figure 7.1 illustrates what is often challenging to represent but is very likely to be readily understood by cyclists and wider audiences. The figure's depiction of the bumping, rattling traces of riding on streets in Boston in the United States has much in common with the NVivo audio traces and affective experiences of participants in this study on the streets of Launceston and Hobart.

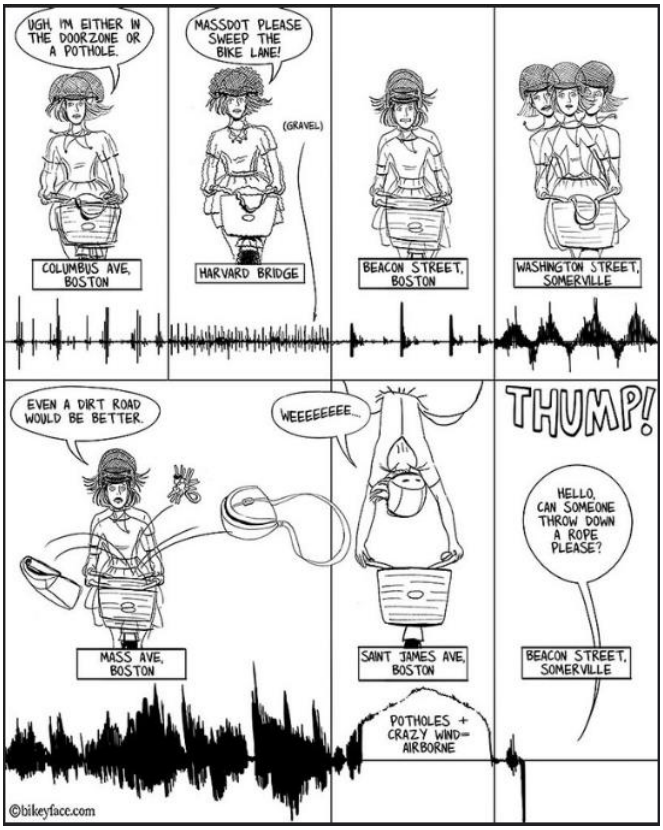

Figure 7.1 – The cartoon grammar of surface rhythms and sensations (Bikeyface.com)

Surface rhythms generate vital sensations and affects, grounding cyclists in the 'feel' of the road. Quantitative surveys have also found that surface quality does make a difference to how people ride. The number of cyclists recorded on a London pathway doubled after resurfacing work (Transport for London 2004). A United States study similarly found that pavement quality was a significant predictor of cyclists' perceptions of the 'bike-ability' of routes (Landis et al. 1998). In another United States study, cyclists rated 'smooth pavement' higher in importance than 'having a bike path' (Antonakos 1994). In a study of the top eleven types of bike rider crashes in the state of Victoria between 2002 and 2012, the 'out of control' encounters with 'slippery, rough or pot-holed road surface, train or tram track' were classified sixth in terms of severity of outcome but, significantly, were also the most *common* type of occurrence (Bicycle Network 2015).

The affective nature of surfaces appears to work largely outside people's conscious registers; the participants constantly wove back and forth, seeking smooth, desirable riding lines, and habitually slowed down on the poorly finished surfaces of footpaths where the choice of riding lines was limited. It was also found that participants slowed down in the vicinity of

pedestrians on footpaths but were *also* slowed naturally by the affective surface frictions when no pedestrians were in sight. The latter finding is relevant to jurisdictions considering legislating to allow adult cyclists to share footpaths, as well as to states such as South Australia, where legislation was recently, and controversially, passed (Australian Broadcasting Corporation 2015).[18] The main concern voiced by members of the public was the discrepancy between a pedestrian's walking speed and the anticipated faster on-road speeds of bike riders being transferred to footpaths. This research shows that cycling speeds on footpaths are much slower in practice, and the presence of bike riders in these shared spaces is much more benign than anticipated by concerned pedestrians. Bike riders naturally slow right down because of surface unevenness (along with the 'friction' of overhanging branches, the narrowness of footpaths, and the risk of cars reversing from driveways). This waymaking practice was found taking place with or without pedestrians being in sight.

Mapping the somatic sensations of cycling offers future directions for investigating what constitutes desirable surfaces, as much as undesirable ones, for city cycling. In reflecting on the possibilities for researching affect and mobility by combining the emerging processes of bio-sensing and bio-mapping with those of mobile video ethnography, Spinney asks:

> [W]hether such technologies cannot be recuperated for a more civic project such as how to design urban environments that emphasise positive affect rather than increased 'efficiency' (Spinney 2015, 241)?

How affect might be researched, understood and finally, perhaps, engineered into cycling infrastructure is challenging, but this research underlines the opportunities for closer partnerships between those using instrumentally-based transport approaches and those using more-than-instrumental approaches.

[18] As of 25th October 2015, cyclists of all ages are allowed on footpaths in South Australia. See http://www.lawhandbook.sa.gov.au/ch12s06s05s04.php

Exemplar 2: Lines of Desire

> Life on the spot surely cannot yield an experience of place, of being some*where*. To be a place, every somewhere must lie on one or several paths of movement to and from places elsewhere. Life is lived … along paths, not just in places, and paths are lines of a sort. It is along paths too, that people grow into a knowledge of the world around them, and describe this world in the stories they tell (Ingold 2007, 2, emphasis in original).

> [T]o approach the road as a live composition … enables me to score over some of the road's own lines of composition when they can be spied for one reason or another … trying to follow a line of the road in a scene or on a horizon that seems to matter (Stewart 2014, 550-551).

As much as the continuous exchanges between surfaces, bike, rider and movement generated surface effects working largely outside the participants' affective conscious experience, the patterns of riding lines taken on cycling journeys were very prominent in their recollections and descriptions. Ride lines are the trajectories traced out by bike riders as they move through urban spaces. The tracing out of a ride line, however, is largely metaphorical. Actual, physical ride lines only appeared occasionally and briefly as lines in mud, through grass, or as wet tyre tracks on dry roads. Even so, 'ride lines' was a well-established and repeatedly used term by bike riders when describing their waymaking.

The findings of the *riding lines* theme are the starting point here for examining the timing and spacing of riding lines. A key point is the time-space conjunction of riding lines oriented in time as much as space. To *grow into knowledge* of riding lines, the phenomenon of desire lines is turned to. 'Desire lines' are a familiar, if largely overlooked, feature of urban landscapes, and they hold insipient meaning for understanding the mobilities of waymaking:

> The desire lines we see across the park, or through the broken fence, tell us as much, or more, about the mobile constitution of society as the formal roads and paths that are made for us to follow (Cresswell 2012b, 9).

Desire lines are usually thought of as falling outside the planned grid of roads and footpaths, yet desire lines and ride lines have many features in common. In considering roads and footpaths as 'live compositions' rather than as transit-corridors (Bonham and Ferretti 1999; Edensor 2004; Harvey 2012; Merriman 2004; 2007; Stewart 2014), the shared features of on-

road riding lines and off-road desire lines are explained. Here the notion of *lines of desire* is advanced to foreground 'some of the road's own lines of composition' (Stewart 2014, 551), whereby the road and waymaking are intertwined. Exploring the off-road mobile constitution of desire lines is a productive point of departure towards rethinking the composition of on-road riding lines. Moreover, in tracing the multiple trails of riding lines, the notion of *lines of desire* is developed further by examining desire lines *and* riding lines through the recently revitalised interest in Felix Ravaisson's ideas of 'habit' (2008 [1838]).

Ravaisson, habit, geography

Habit is commonly understood as an inclination or disposition to act in a certain way, a customary act, or a settled practice acquired through frequent repetition and normative convention (Carlisle 2010; Malabou 2008). This understanding can tie habit to the negative connotations associated with the repetitive behaviour of compulsion or automatism: an unthinking, mechanical action. However, Ravaisson argues that habit (2008 [1838]) is potentially transformative, as Dewsbury and Bissell describe:

> [I]t is the very *process* through which we gain sense, understanding and awareness. What makes habit such a key geographical concept is that the sense, understanding and awareness that habit generates are therefore not properly 'ours', but are much more distributed effects of our ongoing relations with our milieus. Milieu is not a passive backdrop, but a vital performative agent in the ongoing constitution of the human, cuing experience and cultivating habits in myriad ways (Dewsbury and Bissell 2015, 26, emphasis in original).

Ravaisson's account links the dynamics of social order with creative possibilities for change. Such change can be emancipatory (Bissell 2014; Carlisle 2010; Dewsbury 2011; Dewsbury and Bissell 2015; Grosz 2013; Malabou 2008; Sinclair 2011). The release in 2008 of an English edition of Ravaisson's thesis is generating renewed scholarship in everyday habits. For example, in researching low-carbon mobilities, Ravaisson's philosophy of habit (along with that of John Dewey) has been used by transport geographers Schwanen, Bannister and Anable (2012). Their work outlines a more comprehensive, systematic and ultimately affirmative approach to changing behaviour patterns than those of prevailing psychology-based approaches. Their broad-brush approach emphasises the importance of considering 'body-mind-world assemblages' in the formation of low-carbon habits (2012, 530).

This exemplar uses the well-established habits of the experienced cyclists participating in this study, manifest in the patterning of their riding lines, to understand the fine-grained nature of their body-mind-world encounters. It begins by following riding lines – lines of desire – by initially veering off-road and riding the Mowbray Connector line, where this desire line makes collective and individual riding habits visible, as reported in the *riding lines* theme. The exemplar is then returned to the more mundane setting of ride lines in on-road urban grids. Ravaisson's philosophy is used in building what is ultimately an affirmative understanding of city cycling habits.

Desire lines

Desire lines are commonly understood to be the foot- or wheel-worn tracks that appear in open, public spaces between sections of formal, paved paths and roads. They signal a path of less resistance, created organically over time through repeated use. Desire lines trace out an informal, collective activity, but the motivations behind any pursuit of desire lines are poorly documented and little understood. They seemingly trace a subversive pursuit of pathways outside the usual scripts and built forms delivered by urban designers, road engineers and transport planners. Their proliferation, however, is a sign of a broader material and social dynamic. A well-used desire line traces out a collection of individual practices – personal judgements in the use of public spaces leading to a micropolitical democratisation of urban mobility. They appear to affirm the passage of people momentarily free of the planned and regimented spaces of roads and pathways.

The term 'desire line' is attributed to modern transport planning in North America. Its first recorded use is in the 1959 Chicago Area Transportation Study, which states that '[t]he desire line is the shortest line between origin and destination, and expresses the way a person would like to go, if such a way were possible' (City of Chicago 1959, 39). The notion was based on assumptions about the rational decision-making of individuals, but was made 'without imagining all the forces, overt and hegemonic, which circumscribed behavior and desire' (Throgmorton and Eckstein 2000, 7). Despite the term's implicit reference to emotion, its usage has remained largely instrumental – the dominant approach of modern planning. Desire lines continue to be interpreted as an informal, potentially deviant, expression of the mathematical calculus that guides planning more generally: the imperative of getting from A to B. The desire in question, therefore, was construed as the familiar modern impulse for

efficiency and economy. Desire lines, then, were understood simply as expressing the utilitarian vector of a shortcut.

Desire lines are often the bane of urban designers, transport planners and park managers. At times, desire lines are paved over and appropriated into the formal transport network, or are regulated by barriers and barricades. Still, the appearance of desire lines in any landscape is an understandable, humanising feature. One example of the definitive realisation of the collective habit of using desire lines is the 'holloway'. Holloways are centuries-old tracks worn into the English countryside by generations of travellers passing on foot. The term derives from the Old English *hola wegs*, meaning sunken or hollowed out (*hola*) ways (*wegs*) (Macfarlane 2010). Sunken tracks worn down over long periods of time, such as holloways, or the beaten down grass of much shorter use, trace out age-old *wegs*; the ways in which (and on which) people naturally move through their world (Ingold 2007). Desire lines speak of age-old habits of people's waymaking.

Desire lines take on curving, sinuous forms, as landscape and wheel (or foot) enter into a dialogue with its own intrinsic logic and reward, one seemingly at odds with the goal of efficient movement (Lorimer 2011). In a similar fashion, Gaston Bachelard's *The Poetics of Space* refers to the informal path as a 'dynamical, handsome object' with a cadence that works its way into our 'muscular consciousness' (1994 [1958], 11). In the subtle, ribbon-like curves of desire lines is found the evidence of a more-than-human process of accommodation by which the angle of a slope or the composition of a patch of soil or the thrust of a tree's roots gain expression. While bearing witness to an experiential process of understanding and belonging, desire lines may also be relatively static, persistent interventions in the landscape. It is in this way that desire lines mark a space of historical community as a link to the immediate, or more distant, past. Desire lines are an invitation to follow paths made by others; an opportunity to repeat the past. In its temporal depth, a desire line holds out the lure of legitimacy that comes of belonging to a shared world.

The cycling desire line over the Mowbray Connector in Launceston is an informal but well-established means of waymaking across the busy junction. This singular and visible inscription is the starting point for this thesis' exploration of cycling habits more generally. In veering off and following this line across the Mowbray Connector, one question is central: *Are desire lines an interesting but one-off expression of cycling practices triggered by the off-*

road context, or are these sinuous trajectories also vital manifestations of on-road, everyday cycling habits? The following section shows that desire lines are not a simple, one-off expression of cycling encounters with this tree or that rock (in this or that corner of the park), but are intrinsic expressions of cycling habits – the fundamental habits of bike riding expressed in riding lines. Whether those lines are made visible in certain off-road contexts as desire lines, or are forever invisible when riding on the obduracy of road surfaces, riding lines provide insights into cycling habits.

Habit and the Mowbray Connector desire line

> … I'm especially interested in the new practical forms of geometry that are appearing, that are about precisely trying to *build* these spaces [the cusp between present and future] by simultaneously measuring them out differently and by producing new and unexpected alliances out of that work of measurement. If the practitioners of these new arts/sciences can get it right, we might be able to learn to breathe differently by discovering a lot more about the slight surprise of action found in every encounter. That's what I hope anyway (Thrift et al. 2010, 197–198, emphasis in original).

Andy's crossing of the busy Mowbray Connector in Launceston was the one typical expression of a desire line found in any of the 55 ride videos. Somewhat unusually (for an urban desire line) it is the mobility habits of people on bikes rather than people on foot that are centrally implicated in this desire line's creation and ongoing production. The Connector desire line saved cycling time and energy by shortcutting the formal route: the need to travel back and forth alongside the Connector *and* to negotiate a traffic light crossing. Figure 7.3 shows the informality of the desire line smoothly diverging from the planner's script – the unitrail bike path. While it may be an impulsive act to diverge from the unitrail and follow the line for the very first time, the Connector desire line demonstrates a particular and purposeful arrangement in place which people intuitively 'get'. People can make sense of desire lines wherever they are encountered. Cyclists may forego the invitation of the Connector desire line but they would never be bewildered by its presence.

Figure 7.2 – The unitrail and the start of the Mowbray Connector desire line (photograph by the author)

Accepting the invitation of a desire line – their 'earthly offering', as Tiessen writes – brings the line into being (2007, 1). Desire lines emerge over time and in place in certain ways. They project a kind of familiar, repeated engagement of walking or cycling bodies in motion within, and of, that place. Andy's desire line appeared to artfully peel off from the unitrail cycling track, weaving between the larger obstacles of a boulder, a concrete slab and a power pole while skirting smaller obstacles. Throughout each phase of the crossing, the desire line seems to naturally follow the cyclist's inclination, but at the same time to cue their moves. For example, by following the trajectory of the desire line across the two sets of lanes and the median strip divider, at each stage the cyclist gains a position and orientation to clear sight lines and an effective way of crossing the busy, fast-moving traffic flows. The line disappears on the roads. It reappears reassuringly in the gravel on the far side, where it seems to gather up the cyclist before smoothly returning the bike and rider to the unitrail.

From the very first moments of leaving the unitrail until it is re-joined, the desire line opens into an active space. The desire line cues the need to attend to the riding rhythms of riding lines, to surface affects and effects, and to the rhythms and momentum of the passing traffic. The immediate future, though, is never just contained in the trajectories of the present. While movements are progressively sequenced during the ride, their habits keep cyclists open and attentive to their riding milieu:

> Habit becomes a condition of adaptation in a double sense, being a form of contemplation – absorbing the environment, passively lending itself to what is given – and a kind of exercise, informing and transforming the surroundings, appropriating the given conditions for its organic functions (Malabou 2006, in Dewsbury and Bissell 2015, 25).

Over time, each crossing has helped to hardwire the mobility habits of Launcestonian cyclists while also hardwiring their riding lines into the landscape of verdant, grassy roadside verges and gravelly edges. In turn, the material agency of the thick, winding form of the line cues their moves off the unitrail (Figure 7.3) and then back onto the unitrail as part of the daily progression of those habits. The desire line makes cycling riding lines and cycling habits readily apparent.

Desire lines express many things. According to Tiessen, desire lines often emerge 'to satisfy a Paul Virilio-esque need for speed' and to 'efficiently cut corners' (2007, 1). Tiessen also eloquently grounds the encounter by writing: 'the earth itself – its topography, its flows, its tactility, its smell – compels us to follow particular trajectories as we go about our everyday lives' (2007, 1). Here, desire lines are, at times, expressions of playfulness, perhaps meandering to and fro amidst trees. Like Tiessen's nature-based, organic development of desire lines, Stewart reminds us that the materiality of a road, too, 'establishes lines and animates patterns of being and becoming' (2014, 550). Across all scales encountered in the findings, lines of desire are waymaking habits produced by both absorbing the built environment and appropriating that environment.

In describing the habits which produce each individual line of desire, one participant used the image of the ship-maker's splines. Splines or spline curves are thought to have originated in the wooden shipbuilding industry in which long strips of wood were used to craft ships' hulls, developing shapes with smooth, flowing lines that offer the least resistance to flow. Spline fitting, or spline shaping, can be thought of as shaping and smoothing curves of best fit to minimise operating turbulence by generating smooth, laminar lines of flow. Like crafting a hull to establish smooth, flowing lines, cyclists fashioned their smaller and larger curves and loops in smoothing their waymaking.

The smooth, flowing riding lines the participant described as fitting a smooth spline through infrastructure arrangements and traffic flows to offset sharp corners and sharp accelerations

are clearly exemplified in the turns and folds of the Connector desire line. These qualities were also apparent in what other participants reported, and in how they 'did' their cycling practices. Splines generate smooth, curving lines of best fit however the environment is configured. Smoothing, fashioning or sculpting riding lines generates these curves in the same way that the sinuous ribbons of desire lines are made, but without leaving any traces.

Studying the spatial patterns of mobilities can tend to overlook their temporal dimensions. For Bissell (2013), in considering alternative proximities through everyday 'neighbourhood' mobility 'loops', the temporal qualities of these loops are just as important as their more readily apprehended spatial mappings. What the participants described in words, and what became apparent in how they went about their riding, was the timing of their movements and moving. They paced their ride to conserve effort; they smoothed the flow of their ride – their energy-space – to minimise sharp accelerations and decelerations. Their cycling trajectories continually worked at smoothing and sculpting the asperities of *sharp corners* of space and the *sharp accelerations* of time. These habits of waymaking mirrored the building-crafting of boats using the smoothing geometries of spline curves. Their habits of smoothing their ways through the built environment and flows of traffic called upon a different way of measuring space and time. Perhaps they were breathing differently, too, 'by discovering a lot more about the slight surprise of action found in every encounter' (Thrift, in Anderson and Harrison 2010, 198). Like Thrift, that is what I hope for.

Of habit

How can Ravaisson's theory of habit help in understanding lines of desire? Habits, according to Ravaisson, are not the mechanical adherence to actions. Rather, habits allow decisions to emerge from actions. Habits are both enabling and constraining. Habit is said not to follow 'a single prescribed course, but [to] make temporary liveable compromises of activity and passivity' (Shapiro 2009, np). Over time, bike riders learn to expend the minimum effort to achieve the desired outcome:

> Yet by repeated or prolonged exercise, we learn to adjust the quantity of effort, and choose its point of application, in relation to the end that we wish to attain; at the same time, the consciousness of effort is effaced (Ravaisson 2008 [1838], 59).

Cyclists feel a continual need and desire to shape their ride to their immediate environment. This requires that their lines of desire be constantly monitored, adjusted and smoothed to shape the unfolding moving moments and moving places of their riding milieu. Off-road, their individual and collective cycling habits of smoothing ways hone the earth over time to make a single, coherent and sculpted desire line, such as the one visible at the Mowbray Connector. Synthesised from individual and collective iterations, these are visible markers of habit. Well-honed habits, though, also contain the ability to deftly make temporary compromises when, for example, the weather prevails (Figure 7.3).

Figure 7.3 – Multiple lines of desire (photograph by the author)

The smoothing of sharp corners and sharp accelerations is part of the constant metering of effort to application. Drawing on Ravaisson, Grosz argues that:

> Habit performs a kind of condensation or compaction of bodily action, and a rationalization (and rationing) of the effort an act requires ... It skeletalizes action, making it more efficient, minimizing the time and effort it requires while maximizing its effects. Habit is the creation of a new bodily mode of existence, the learning of a way of simplifying action by selecting its key muscular efforts while hiding their conceptual accompaniments (Grosz 2013, 221).

In this way, Ravaisson's habit can help in making sense of how people go about their everyday cycling practices. Habits and desires create ways to smooth journeying; they assist cyclist's waymaking through hard, fixed infrastructure and the busyness of traffic.

To be clear, habits work in varying ways across rides, and trying to draw specific conclusions about this or that specific encounter is problematic. In her study of everyday practices of walking, Middleton notes the emerging significance of Ravaisson's work to geography, but adds that much 'of this theoretically sophisticated work is highly abstract and provides little sense of how these concerns can be empirically engaged with' (Middleton 2011, 2865). Unlike Schwanen et al. (2012), whose work is on formulating policy intervention though rethinking habits and low-carbon mobility, Middleton's work is highly relevant to this study because it grapples with many of the empirical concerns the study has encountered. For Middleton, the 'way in' is through participant accounts, particularly when habits are disrupted and people become much more aware of behaviour. This study relied on accounts as well as video-based observations.

The findings about on-road riding lines can be further explained by examining the organic emergence of the collective habit of cyclists worn into the grass verges across the Mowbray Connector over time. The desire line traces out mobile encounters and mobile habits as much as on-road riding lines. The participants' habits enabled positive encounters with their cycling worlds; riding smoothly and predictably rather than erratically is a productive cycling habit. While no contrasting 'bad' habits appeared in the analysis, Malabou cautions against overlooking the fact that 'it is one and the same force which engenders good and bad habits' (2008, xix). In a somewhat similar vein, Thrift writes that:

> [N]ot everything is focused intensity. Embodiment includes tripping, falling over, and a whole host of other such mistakes. It includes vulnerability, passivity, suffering, even simple hunger. It includes episodes of insomnia, weariness and exhaustion, a sense of insignificance and even sheer indifference to the world (Thrift 2008, 10).

The participants did 'zone-out', and there were no doubt times of indifference, and perhaps even boredom, during rides. They spoke of mistakes, near-misses, and crashes. These may have been indicators of the afflictions or 'tics' that can be ingrained in otherwise skilful habits (Bissell 2013) – challenges to be overcome and set aside – or they may have been absorbed as hard-won experiences to strengthen desired habits.

It is entirely plausible that the first lot of cyclists to spontaneously venture outside the planned grid and across the Mowbray Connector did so through assuredness in their well-honed habits of constantly smoothing their riding lines in the urban-grid of Launceston. Like

Ingold's wayfarer, desire lines mark the habit-mobilities of successful inhabitants. Whether making their way off-road across the Mowbray Connector, or on-road through the urban grids of Launceston and Hobart, these cyclists are neither 'placeless nor place-bound but place-making' (Ingold 2007, 101).

Desire lines are an unconscious expression of people's desires and habits. They exceed the boundaries of the planner's script, and in so doing express a kind of alternative mobility (Cresswell 2012). The unsanctioned crossing of the Mowbray Connector might be construed as a somewhat illicit, even risky, off-road deviation from the planner's script. To ride it calls on the kind of compaction of effort mentioned by Grosz, the *mind-body-world* assemblage of Schwanen et al. (2012) and the cueing of milieus (Dewsbury and Bissell 2015). It certainly calls for the myriad habits and practices of waymaking already discussed: the heightened awareness and interaction with their milieu; the smoothness and predictability as part of seamless bike-rider and car-driver co-productions; balance and stability; and the feeling of the haptic geographies of surface affects.

Lines of desire, the on-road expressions of desire lines, also signal a kind of alternative mobility which exceeds the planner's scripts. Unfortunately the distinctive nature of cycling lines of desire goes all but unnoticed in the planner's instrumental calculus. By paying more attention to how cycling actually takes place, how cyclists look to smooth their ride lines and ride momentum, the bikeability, or not, of cycling infrastructure become much more apparent. 'Bikeability' is a term that is becoming more established in the transport literature (Austroads 2010; Pucher et al 2010) yet it is a term that is loosely defined and eludes strong, productive connections back into the actual planning of road infrastructure. By paying attention to surfaces and ride lines, potentially productive connections into policy and planning to improve urban bikeability may be discovered.

Alternative physical and aesthetic fluidities

> Surfaces and interfaces can be productive, enlivening, and enchanting spaces, where diverse materialities meet to produce physical and aesthetic mixtures, fluidities, turbulence, and movement; whether we are talking about the meeting of paint and canvas, sea water and air, rubber and tarmac, ink and paper, or concrete and soil (Forsyth et al. 2013, 1017).

This short final section is very much in the spirit of the alternative, 'more-than' approach of this research, pushing beyond cycling-as-transport into cycling as waymaking (Dewsbury et al. 2002; Lorimer 2005; Thrift 2008). In thinking about the extract from Forsyth et al. (2013) above and the overlooked, absent-present nature of surfaces, the productive and enlivening accounts borne out of the ordinary encounters of bicycles ridden on tarmac and concrete surfaces *are* more-than-ordinary. The material contact of rubber-on-tarmac, so vital to generating surface affects and lines of desire, has also been used to paint aesthetically fascinating patterns into road-spaces. Using a device attached to the rear frame of a bicycle, and dispensing a chalk mixture onto the back tyre to mark their trajectories, two artists can leave traces of their lines of desire (Figure 7.4).

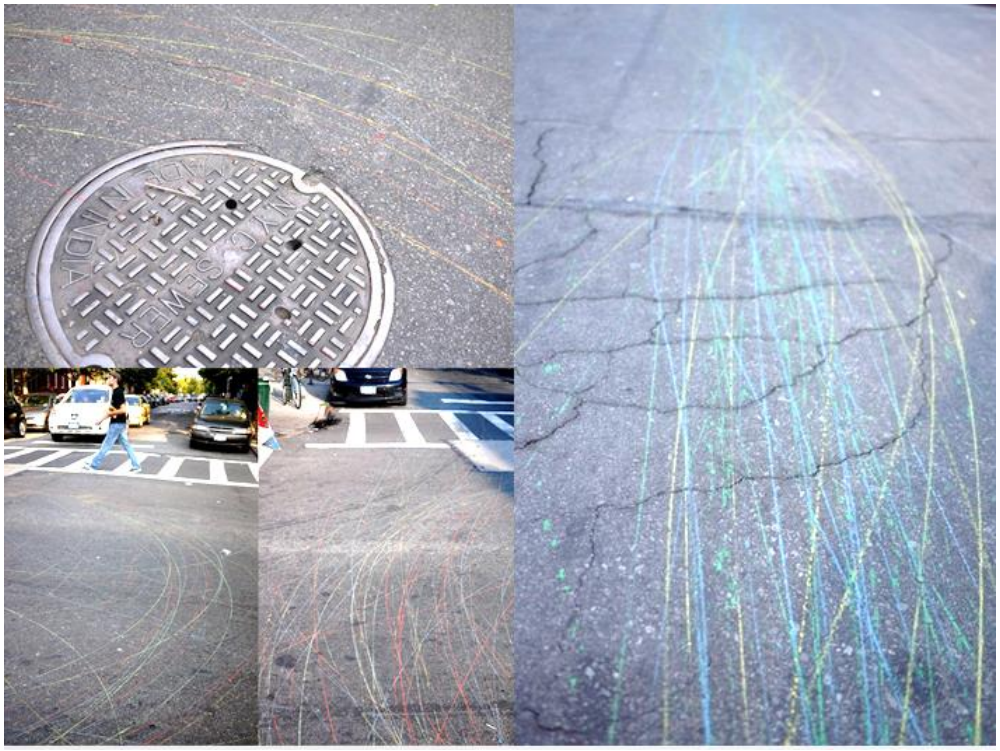

Figure 7.4 – Lines of desire traced in the streets of New York, USA (Bikecontrail.com)

Desire lines are not the trajectories that bike riders save for off-road pursuits. Rather, the desire lines we see traced across the park (or through the broken fence) are the occasional and fortunate glimpse of how the earth itself, and human desire and habits manifest themselves even in the midst of the mundane obduracy of the urban grid. Whether worn in grass and thought of as desire lines, or traced out by chalk and wheels on tarmac as ride lines made visible, there is nothing tentative or ambivalent in the habit-makeup of these smooth, sinuous lines of desire. Perhaps too, lines of desire are the passing impressions of '*a figure*, an *idea in*

action' (Ravaisson 2008 [1838], 59, emphasis in original) – the collectively creative mobility habits of waymaking which exceed any single ride or any individual rider.

Moving on

Chapter 7 is the last of the four analytically-informed findings chapters. The first three established the timing-spacing-acting themes of waymaking. This chapter has then developed two key narrations of waymaking. Inevitably, lines of desire and surfaces affects overlap and intertwine as the fine-grained, moment to moment choices, desires and habits of participants seeking out certain surfaces and avoiding others. What these four chapters demonstrate is how cyclists 'inhabit' urban time-space in ways which go far beyond the utilitarian perspectives and understandings of cycling-as-transport. The following and final chapter summarises and concludes this work by returning to the research questions.

Chapter 8 Knowing and doing city cycling

Bikes are lightweight, small and mechanically simple instruments of mobility compared to bigger, heavier and more technologically sophisticated cars. The 'basic mechanics' of cycling are 'relatively straightforward', involving the conversion of 'a stepping motion into a rotating motive force' (Jones 2012, 649). In utilitarian terms, this observation is itself straightforward. Once mastered, the basic mechanics of riding a bicycle become second-nature; a well-embodied habit working in unison with a simple arrangement of Victorian era componentry. Yet the practice of cycling is far from straightforward and involves considerable material, cognitive, affective and embodied complexity, as this research demonstrates. In the act of cycling, machinery and person, bike and rider, cohere as a metastable entity. This metastable entity – the bike-rider – is constantly working to maintain stability and coherence through the everyday practices of waymaking: being aware, becoming fused to the bike, riding smooth and predictable lines, and co-producing a host of interactions with people, objects and infrastructures.

This study developed the notion of waymaking to shift understandings of cycling beyond the utilitarian, *cycling-as-transport* fixation dominating most cycling research into something much more. Out of this data-rich study has come a more-than-instrumental account of cycling born from paying attention to the *doing* of cycling. Waymaking shows how the mobile practices of cycling can be understood as a more-than-instrumental encounter with the city, answering the principal research question set out in Chapter 1. The study used the emerging mobile methods of video ethnography to generate new knowledge by focussing on the mobility practices of everyday cyclists in two Australian cities. To answer the supplementary research question, the methodology chapter and the four analytically-informed findings chapters set out in detail the methods, their application, and, importantly, a novel means of engaging with research 'noise' in researching mobile subjects.

This final chapter distils the insights of the study by summarising four key contributions: advancing mobile methods, active awareness, the co-producing of on-road encounters, and surface affects and lines of desire. As for any study, there are limitations in this study's approach and methods. For this study, what was actually videoed had a major influence on what was later discussed. For example, it always felt too intrusive to start filming the participant before the inevitable greetings, and before the small talk and tasks of readying

their bikes and themselves for the journey was complete. Hence there was a limited amount of video data gathered about how participants prepared for their trip. On the other hand, it was quite natural to keep the video running until bikes were parked and secured at journey's end, and the section on bike parking reflects this. So, while the gaps and limitations are identified throughout this chapter, they are also accompanied by discussions of opportunities for further research and of the applications to cycling policy and planning if the way people actually do their cycling – their waymaking – is put to 'work'. Already the study has had one direct outcome (detailed below): a web-based application based on the methods and findings of the research. 'Decide your Ride' is designed to encourage bike commuting to and from the University of Tasmania's Hobart and Launceston campuses.

Advancing mobile methods

This research project is the first mobile video ethnographic study undertaken in Tasmania. It was also the first time that the Tasmanian Social Science Human Research Ethics Committee has granted approval for video-based research in public spaces. It also appears that this is the first time that a study of this kind using the mobile video methods of the 'follow-along' has been attempted in Australia. The interview and video data were analysed using thematic analysis. By using NVivo, and by including several themes' example extracts from the final table in Appendix B, the reliability and credibility of the findings can be demonstrated. The research was carried out in two Tasmanian cities. By purposively sampling for experienced cyclists, a range of participant ages, for gender balance, and for a variety of rides and ride conditions in two Australian cities, the empirical findings are transferable to other Australian urban contexts, and perhaps beyond.

This study treated the mobility framework of everyday urban travel as a collection of entangled elements of transport, representation and practice. The under-researched area of mobile practices was identified as an alternative, more-than-instrumental approach to the dominant approach, where problematising, and problem solving, is undertaken instrumentally. This study, and the contributions outlined in this section, is not set out as an incompatible alternative to those instrumental approaches. Rather, more-than-instrumental approaches allow different and perhaps novel ways of understanding cycling.

Cycling viewed through the record of the video camera opens it up to new interpretations and understanding. The video footage brings into fine-grained view the otherwise fleeting and ephemeral practices of cycling. The handlebar-mounted footage showed a general following view of the cyclist and their cycling milieu. The helmet-mounted camera footage tracking head movement brought the cyclists shifting focus of attention into sharp relief. While most of the video, and most of the subsequent analysis, was based on the follow-along method, both contributed to a more rounded perspective of cycling practices. Also, by engaging with the visual vibrations and the audio rattles of camera 'noise', rather than ignoring or suppressing them, a new appreciation and understanding of the affects and effects of road surface interactions was gained. The use of video methods for mobilities research is an emerging epistemological and methodological field of social science. These findings show video-based research methods to be an accessible and practical way for moving with subjects and researching their cycling mobilities.

A number of analytical devices were used in the study which, in different ways, can contribute to mobile methodologies and methods. Introducing the mobile entity of the bike-rider shifted the focus away from just the human cyclist. Acknowledging the assemblage of the bike + rider working in unison as the bike-rider opened up spaces for thinking about the unique – at once complex and simple – timing-spacing-acting qualities of this fusion. While cycling is a deeply embodied and sensuous experience it is oriented to the urban environment is particular ways arising from intertwined identities of this person-thing. The bike-rider entity helped, for example, in generating the findings of the fused bike-rider, riding lines and cycling surfaces. The rather diffuse identity of the bike-rider was balanced with the rich mix of quotes and images taken from the interview accounts and video footage of the Launceston- and Hobart-based participants. As Spinney points out, 'cyclists are a heterogeneous bunch' (2010, 114), and the breadth and scope of the nine themes and two exemplars reflects and celebrates that diversity.

Another analytical device was the storyboarding of video extracts and interview excerpts for the analysis and the reporting of the findings. By matching the dialogue of the interview with the corresponding video sequence being discussed, storyboarding adds clarity and vibrancy to the findings. For example, Figure 5.4 shows Cate skirting a small but ominous-looking pot-hole in an otherwise smooth road. She is narrating, in an understated way, the need to avoid that unpleasant (and quite possibly destabilising) dip in the road. Storyboarding can invoke

the moving moments of riding home on a summer's evening after work (Figure 4.6). Here, the 'how am I spinning?' immediacy of *really* enjoying the fast-moving rhythms and sensations of cycling at speed through a familiar, smooth, sweeping curve, is brought to life by combining image and text. Storyboarding cycling practices synthesised two sources of data to produce a unique means of representing and animating this research.

Being mindfully aware, co-producing smooth encounters

All of the participants were very aware of the possible risks of untoward events taking place in the midst of any of their otherwise routine trips. When participants encountered potentially risky situations, or felt threatened, the most common response was to become increasingly alert and responsive to the unfolding situation. They achieved this by heightening their sensory awareness by being mindfully aware, as the opening theme of the findings chapters, *in the moment*, demonstrated. While it might be argued that there is a risk of over-attributing agency, and thus the ultimate responsibility for safety, to bike riders, research shows that public perceptions of the risk and hazards of cycling are one of the key reasons dissuading many people from taking it up. The prospect of sharing busy traveling milieus with much larger, heavier and quicker motor vehicles is often very intimidating to prospective cyclists. What these practices of awareness actually show are the largely unconscious, sensory strategies that develop over time through regular cycling habits. Besides offering a new and interesting avenue for understanding and researching the complex issue of safe city cycling, the practice of intensifying sensory awareness (and then co-producing smooth encounters with other road users) can contribute to, or reinforce, training programs for cyclists (see Decide your Ride, below).

Of all the on-road risks they faced, it was their interactions with motor cars that most occupied cyclists' thoughts and attention. This new knowledge of how experienced bike riders safely negotiate their way through city traffic on a daily basis is important. This study appears to be the first to attempt to detail the fine-grained practices keeping cyclists safe. Cyclists reduce their bike riding risks by routinely heightening their awareness, by being visible, by *being seen to be* predictable, by hand signalling, and by riding smooth lines. These practices set the tone for intermingling with cars on roads and pedestrians on footpaths. Keeping safe by reducing their on-road exposure to hazard and risk was almost always done

in response to motor vehicle traffic. The study detailed the step-by-step practices used by cyclists in collaborating and negotiating their way through these crucial encounters.

Co-producing safe encounters between bikes and cars is not only important for individual cyclists; these were also shown to be vital encounters in other ways. Co-producing smooth and predictable encounters is a powerful ongoing micropolitical affirmation, a mutual acknowledging and strengthening of the right of both cyclist and driver to shared road-space and safe passage. More work could be done in this area. For example, while it would be challenging methodologically, motorists' perspectives of on-road encounters and interactions (or not) with cyclists could be developed. There were intriguing glimpses of motorists' behaviour revealed in the ways passing motorists shaped their driving lines to establish the widest, and smoothest, passing margin. There is a temptation, too, to impose binaries on cyclists and car drivers along the lines of the 'vulnerable cyclist' and the 'uncaring car driver'. This can construe cyclists as powerless and ever the victim. This study shows something quite different by documenting in detail the vital interplay between drivers and cyclists through behaviours that push far beyond the dualistic limitations of 'good' cyclists and 'bad' car drivers.

Sensory affect, awareness, being smooth, being predictable, and co-producing smooth encounters are shown to be vital for safe cycling, yet there has been very little work (if any) to research and understand these practices and behaviours. Indeed, as Chapter 2 showed, safety research is routinely approached from a transport standpoint, and one which centres on hazards, risks, and the consequent fear of cycling. There is no doubt that cycling safety, and safe cycling, pose difficult questions for cycling research, policy, planning and practice. There are no simple solutions. For example, mundane and overlooked surface interactions – the most common cause of crashes, according to one Victorian study – were shown to pose potentially volatile risks throughout journeys. Separation from car traffic, too, is often portrayed as the 'holy grail' for safe (and attractive) cycling, but the aftermath of the unitrail cycle path crash is a sobering reminder of the contingency of the bike and rider assemblage. Research into cycling safety is challenging for all manner of approaches. What the findings of *active awareness* and of the co-production of smooth, safe encounters show are new and innovative opportunities for cycling research, training and practice.

Lines of Desire

Lines of desire are a particular narration of waymaking developed by investigating together the on-road phenomena of riding lines, and the off-road phenomena of desire lines illustrated by the example of the desire line used in crossing the Mowbray Connector in Launceston. Riding lines are fashioned by cyclists moving in and through roads, traffic and infrastructure. These patterns were visible in the video footage and were often used by the participants to explain their actions. Desire lines are ubiquitous but largely overlooked patterns of movement left by people as they cut corners and moved outside the planned scripts of footpaths and cycleways. Lines of desire are the mobile practices employed in smoothing the way for cyclists; their timings and spacings of their everyday urban encounter. Habit hones an individual's efforts as witnessed by their ride lines, but habit was also argued to stretch beyond individual effort as witnessed in desire lines. Lines of desire are based on individual as well as the collective habits of smoothing and sculpting mobile on-road practices.

The desire line across the Mowbray Connector illustrates the significance of the more than instrumental aspects of cycling mobilities such as habits. The line also illustrates the way these habits are simultaneously entwined with quite utilitarian desires to shortcut journeys. The sometimes blurring of instrumental and more than instrumental aspects of waymaking were also evident in the *reasoning and sensing* theme. The theoretical setup of this study acknowledges this overlap and interplay. Instrumental, and more than instrumental dimensions, are complex and are best understood in the light of the other. The value of studies such as this is that they add to holistic understandings on of daily mobilities, and underline the possibilities for further work combining these findings with those of transport studies.

Lines of desire illustrate how cyclists negotiate infrastructure by smoothing the timings and spacings of encounters throughout their journey. Surface affects and lines of desire are important as there has been little research investigating how cyclists actually engage with road infrastructure. Much of the cycling in this study was found to be outside purpose-built cycling infrastructure. Better understandings of what constitutes safe and desirable bike riding, whether cycling infrastructure is present or not, can be enhanced by becoming increasingly aware of the affect and the effects generated as cyclists purse their everyday lines of desire.

Surface Affects

One novel finding concerned the importance of road surfaces. The participants' emotive responses to the video images of familiar potholes, rough sections of road, and poorly repaired surfaces in the theme of *riding surfaces* were combined with the investigations into camera shake in the *shaking, rattling* theme. These two themes arose from quite different data sources but were combined in the surface affects exemplar, adding to the reliability and generalisability of the findings. Surface interactions are an unavoidable and necessary dimension of cycling which shape city cycling in mostly subtle, unconscious ways. Rough surfaces were avoided; smoother surfaces were sought out. Rough and uneven riding surfaces make a difference to cycling, and participants were quick to point out the more extreme examples, such as potholes, that they regularly avoided.

With or without bike lanes (and the majority of cycling was done without them), most cycling happens at the margins of roads. The videos, and, to a degree, the haptic 'representations' found in the NVivo tracings, showed that the places where much of cycling happens, at the road margins, are almost always rougher than places used by cars, the main traffic lanes. The tracings also indicated that the affects and effects of the rougher footpath surfaces naturally constrained and slowed cycling speeds. This finding needs more research work but is potentially very relevant to jurisdictions contemplating changes to their cycling on footpaths laws, or to jurisdictions that have just changed their laws, such as South Australia.

Surfaces and surface interactions are notably absent from mobilities research. One exception which reveals the importance of cycling surfaces was the off-road study of mountain biking by Brown (2016). What is relevant and interesting is that, as for this research, surface interactions afford much more agency and diversity to a bike rider (be they on-road or off-road) than the usual labels of simply 'rough' or 'smooth' suggest. For the city cyclists of this research, while surfaces were found to be essentially absent from their thoughts, except for extremes of roughness or smoothness, the surfaces were undoubtedly very present in the pre-cognitive haptic sensations and rhythms of their cycling.

Surfaces do matter, as the ten year survey of cycling crashes in Victoria shows. Loss of control due to slippery or uneven surfaces was the most common cause of crashes (Bicycle Network 2015). The waymaking practices exemplified by Surface Affects matter just as

much as those of Lines of Desire to the 'bikeability' of cities, but conceptually, empirically, and practically these are areas that have been largely overlooked prior to this research. As Spinney (2015) has noted, there are emerging opportunities for mobile video ethnography researchers to work across disciplines to alert and re-orientate civic designers to what might actually enable positive urban cycling experiences of the kind that make cities more bikeable, and, indeed, more liveable.

Decide your Ride

Decide your Ride is a web-based app for people interested in commuting by bike to and from the University of Tasmania's main campuses in Hobart and Launceston, but held back by their concerns about cycling on roads and in traffic. While the project is infused with mobilities-based ideas, the key to it lies in the practice-based findings and insights of this study. Decide your Ride uses the ride videos of several bikeable routes into campus as a type of virtual guide or 'buddy' system. As for this research, I used the video-based mobile method of a handlebar-mounted camera to generate footage which mimics the view from the saddle. On screen, the routes unfold with comments and advice in text boxes which appear and disappear as your virtual buddy 'talks' you through the ride. The project shows how the streets and footpaths into campus can be made into accessible cycling spaces, even for cyclists inexperienced in finding ways through busy city centres. [19]

The findings of this thesis were condensed into the onscreen commentary which, in combination with the videos, makes visible the ordinary practices and rhythms of everyday commuting. For example, the text boxes are used to animate how intersections can be negotiated, how lines of parked cars passed, and how footpaths are shared without alarming pedestrians. The text boxes highlight the cycling habits found in this study, such as being mindfully aware and those of being smooth and predictable. The moving vision shows the rider seeking desirable riding lines which flow in and out of the main flows of traffic, or taking advantage of the affordances of footpaths when needed. The now inevitable bumping, jolting camera vision is used to illustrate and evoke the fine-grained haptic geographies of

[19] See http://www.utas.edu.au/commercial-services-development/sustainability/transport/decide-your-ride

riding Hobart and Launceston's changing road surfaces. The videos are designed to attune people to the rhythms of street infrastructure, traffic management and traffic flows, but also to the open-ended possibilities of improvising rhythms as part of urban cycling practices.

Decide Your Ride is aligned with the university's approach to sustainable transport but is designed to loosen the grip of transport-exclusive thinking. The drop-down question and answer boxes using the cartoon graphics of the Boston-based cartoonist Bekka Wright (Figure 7.1) are employed to promote an expanded vision of city cycling. The combination of route videos and webpage is designed to shift agendas away from the primacy of transportation by animating (without over-animating) the vital place of practice-based knowledge in the way we know and do city cycling.

The webpage was launched in April 2016. The responses have been very positive. The videos were initially just Hobart-based but have since been expanded to include Launceston. The real value, of course, will be if the application sparks decisions which, in time, stabilise and cohere as singular and collective shifts in people's everyday habits of urban mobility.

Closing thoughts

> If you let it go too far it would be the end of everything. You would have bicycles wanting votes and they would get seats on the County Council and make roads far worse than they are for their own ulterior motivation. But against that and on the other hand, a good bicycle is a great companion, there is a great charm about it (Flann O'Brien 1996 [1967], 65).

In the back and forth debates on how, or indeed whether, cycling can be integrated into the mainstream of travel choices in contemporary Australian cities, there is a sense that we are a little threatened by the bicycle. Perhaps we fear that things will get out of hand. Perhaps the potential slippage from spaces currently dominated by and for cars, to sharing road space, and, finally, to ceding space, looms all too large. The momentum of travel choice, though, is still firmly oriented towards car travel as the failure of the instrumental, *build it and they will come* approach of the National Cycling Strategy shows. The infrastructure is being built (bicycles, it seems, are getting some votes), but the people are not coming.

The failure to double cycling participation, the key aim of the strategy, may have been due to the wrong objectives being imposed and the criteria for their evaluation too narrow whereby improvements in the extent and quality of infrastructure may well be enhancing the 'ride wellbeing' experience for those already cycling. These important but elusive qualities of rider wellbeing shaped by ongoing interactions with roads and infrastructure however remain difficult to assesses, particularly under the transport dominate approaches typified by the strategy. The qualities of riding surfaces, for example, were shown to be regularly overlooked in urban cycling research and application, thereby backgrounding the role this mostly subtle but crucial interface plays in cyclists' wellbeing, safety and risk. More attention to the types of ride qualities drawn out in the themes and exemplars of this research will contribute to better understandings and outcomes for regular riders. More recognition, coupled with more affirmation of these cycling qualities, might also resonate with the large portions of western urban dwellers who identify as 'interested but concerned' (Dill and McNeil 2013, 129) about venturing out on bicycles.

The work of this thesis, however, was not to investigate the failings or otherwise of the National Cycling Strategy. The difficulty of changing entrenched social norms and practices using exclusively instrumentally-based transport approaches through is clearly demonstrated through the inclusion of the strategy in Chapter 1. The failure of the National Cycling Strategy offered this research a point of departure, whereby simply labelling and 'knowing' cycling as transport (whether 'environmentally-friendly', 'sustainable' or 'active') missed other vital, non-instrumental forms of knowledge.

Still, despite the seemingly entrenched habits and car-centred norms and practices, there are people who readily choose the companionship of their bike. They pick up helmets rather than car keys, get on their bikes, and ride out into their streets making their way to work, to the shops or maybe just to visit friends. In roads and streets dominated by the rhythms of motor vehicles, these people have managed to align and stabilise their cycling practices, laying down subtle but nonetheless distinct patterns and rhythms of their own, often side-stepping but always subtly reshaping the dominant everyday normative rhythms and structures of driving. Prioritising the view-from-the-saddle to understand how people go about *doing* cycling is a critical yet overlooked area of cycling research. Gaining an understanding of these practices amidst the push and pull of the everyday flows of urban life has been at the heart of this research.

I have noticed that my own practices of waymaking have been influenced by the findings. I remind myself to be smooth and predictable while city cycling. I am quite deliberate in negotiating busy road spaces the way Allie did in her fast-paced collaboration on a busy Launceston road, or the way Alice demonstrated in timing her move out of a bike lane into the car lane after crossing Brisbane Street in Launceston. While it is not always possible, I try to be proactive in looking *at* drivers and establishing eye contact *with* them. I find myself readily acknowledging the driver giving me the time and space to pass safely. These small affirmations are surprisingly satisfying. They are very much in the spirit of Steve's nod to the driver of the white ute, and of Deb's shared empathy of 'here we are on the road again'. Perhaps unsurprisingly, too, I am much more in tune with the mostly playful, vibrant materiality of surface interactions – the ever-changing *feel* of road surface rhythms.

The principal research question identified mobile practices as a way into generating more-than-instrumental understandings of everyday cycling encounters with cities. So rather than construe cycling practices to be a subset of transport, the study has framed transport and practice as subsets of urban mobility. Making sense of the ways in which people make their way by bicycle through roads, traffic, infrastructure, weather and geography, helps in making sense of cycling-as-transport. By placing the mobile practices of cycling subjects at the centre of this research, the everyday mobile practices of bike riding in Launceston and Hobart have become a means of reconfiguring how we understand and how we might do city cycling.

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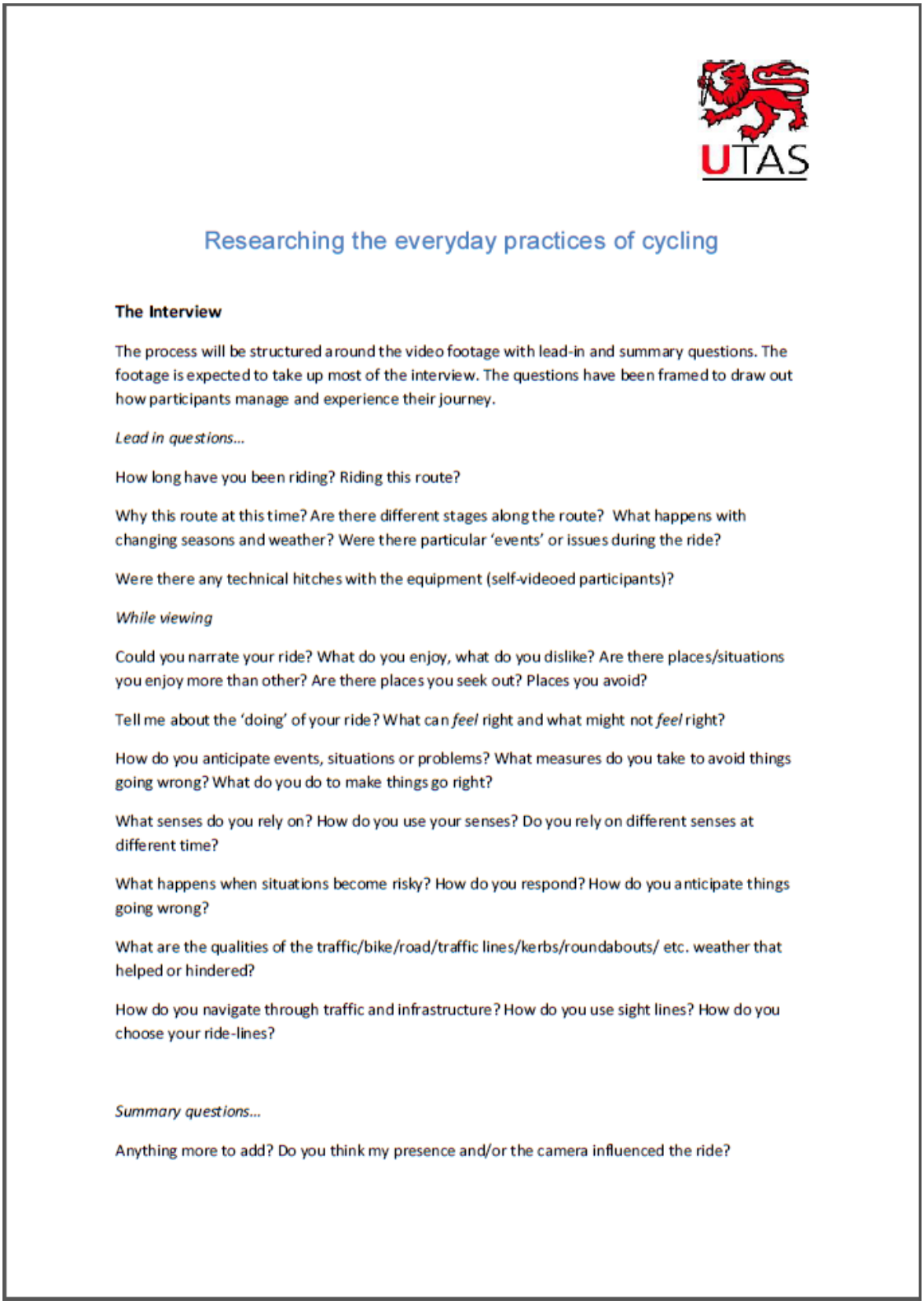
Appendices

Appendix A: Interview questions



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Researching the everyday practices of cycling

The Interview

The process will be structured around the video footage with lead-in and summary questions. The footage is expected to take up most of the interview. The questions have been framed to draw out how participants manage and experience their journey.

Lead in questions...

How long have you been riding? Riding this route?

Why this route at this time? Are there different stages along the route? What happens with changing seasons and weather? Were there particular 'events' or issues during the ride?

Were there any technical hitches with the equipment (self-videoed participants)?

While viewing

Could you narrate your ride? What do you enjoy, what do you dislike? Are there places/situations you enjoy more than other? Are there places you seek out? Places you avoid?

Tell me about the 'doing' of your ride? What can *feel* right and what might not *feel* right?

How do you anticipate events, situations or problems? What measures do you take to avoid things going wrong? What do you do to make things go right?

What senses do you rely on? How do you use your senses? Do you rely on different senses at different time?

What happens when situations become risky? How do you respond? How do you anticipate things going wrong?

What are the qualities of the traffic/bike/road/traffic lines/kerbs/roundabouts/ etc. weather that helped or hindered?

How do you navigate through traffic and infrastructure? How do you use sight lines? How do you choose your ride-lines?

Summary questions...

Anything more to add? Do you think my presence and/or the camera influenced the ride?

Appendix B: The final collation of themes, codes and coding densities

Chapter and themes	Sources	Frequency
Moving moments	4	4
In the moment		
affect	5	14
active awareness	16	164
awareness of feeling safe, comfortable	15	72
awareness of vulnerability, aversion, risk	14	77
sensing	10	28
feeling - tactile sensations	12	15
listening and hearing	15	24
looking and seeing	18	40
sensing warm, hot, cool, cold	11	14
Fused to the bike		
speed, momentum	18	162
degrees of effort, more or less (pedalling, coasting)	15	72
bike-body comportments	18	187
balancing	7	9
stopped, waiting (poised)	13	30
order and disorder	14	67
riding rhythms	10	28
Riding lines		
ride lines	18	177
Moving places	4	5
place	18	25
space	8	29
atmospherics (weather, lightness, darkness)	13	36
Infrastructure		
Infrastructure	3	5
bike lanes	13	42
boundaries	2	3
footpaths	9	20
laneways, cross-country routes	9	13
parked cars	14	37
riding surfaces	18	117
road furniture (mediums, markings, covers, signs)	14	29
roads, main roads	13	23
roundabouts and intersections	15	49
topography	17	57
crossing mobility spaces	15	58

Chapters and themes	Sources	References
Mobile entities		
busyness	15	52
mobile entities	1	2
cyclists	8	11
drivers	18	30
pedestrians	16	41
the bicycle	18	28
vehicles	18	34
Shaking, rattling		
rough roads, smooth roads	17	30
noise	5	7
Journeying	8	27
Reasoning and sensing		
reasons, rationales, the why I cycle	15	56
knowing, knowledge, experience	17	89
comparing other cultures, settings, situations, habits	15	42
vitality, feeling-good, delight	16	82
recollecting significant events	11	34
Collaborating	8	25
collaborating, asserting, accommodating	18	299
gauging, checking, assessing, judging	18	208
gestures, signalling, seeking (eye) contact	18	118
orchestrating events	11	21
responding to encounters	5	6
Making journeys		
the ride	16	108
tactics	18	134
embodying tactics	14	35
visible and invisible	15	63
trust, distrust	15	50

Appendix C: Consent form

Participant Consent Form [version 1] [10/7/13]

Researching the everyday practices of cycling

This consent form is for participants taking part in this study into the everyday practices of urban cycling.

1. I agree to take part in the research study named above.
2. I have read and understood the Information Sheet for this study.
3. The nature and possible effects of the study have been explained to me.
4. I understand that the study involves videoing a number of my routine rides by either a camera mounted on my bike or by a 'follow along' method with the camera mounted on the researcher's bike. It will also involve an interview of about 60 minutes that will be recorded and transcribed. There will be opportunities at each stage to review and edit video footage and to review and revise transcripts if desired.
5. I understand that participation involves no more risk than that of my normal pattern of regular cycling.
6. I understand that all research data will be securely stored on the University of Tasmania premises for five years from the publication of the study results, and will then be destroyed unless I give permission for my data to be archived.
   I agree to have my study data archived.
   Yes ☐ No ☐
7. Any questions that I have asked have been answered to my satisfaction.
8. I understand that the researcher(s) will maintain confidentiality and that any information I supply to the researcher(s) will be used only for the purposes of the research.
9. I understand that the results of the study will be published so that I cannot be identified as a participant.
   Yes ☐ No ☐
10. I understand that my participation is voluntary and that I may withdraw at any time without any effect.
    If I so wish, I may request that any data I have supplied be withdrawn from the research until 30 December 2014.

Page 1 of 2

Participant Consent Form [version 1] [10/7/13]

Participant's name: _____

Participant's signature: _____

Date: _____

Statement by Investigator

☐ I have explained the project and the implications of participation in it to this volunteer and I believe that the consent is informed and that he/she understands the implications of participation.

If the Investigator has not had an opportunity to talk to participants prior to them participating, the following must be ticked.

☐ The participant has received the Information Sheet where my details have been provided so participants have had the opportunity to contact me prior to consenting to participate in this project.

Investigator's name: _____

Investigator's signature: _____

Date: _____

Page 2 of 2

Appendix D: Information sheet

UTAS

Researching the everyday practices of cycling

This is an information sheet for participants

1. Invitation
You are invited to participate in a research study into the everyday practices of cycling in urban areas. The study is being conducted in partial fulfillment of a Doctor of Philosophy for Roger Vreugdenhil through the School of Geography & Environmental Studies, University of Tasmania (UTAS) by;

Researcher:

Dr Stewart Williams (Lecturer, School of Geography & Environmental Studies, UTAS)

Researcher:

Dr Aidan Davison (Senior Lecturer, School of Geography & Environmental Studies, UTAS)

Student Researcher:

Roger Vreugdenhil (Doctoral Student, School of Geography & Environmental Studies, UTAS)

2. What is the purpose of this study?
This study explores the everyday practice of cycling in Launceston and Hobart. The research examines how bike and rider combine to negotiate roads, infrastructure and traffic during regular cycling trips such as commuting to work, to the shops or the city. Cycling as it is actually practiced has been largely overlooked as a field of research yet this type of research offers new and innovative ways of gaining insights into the part played by cycling in systems of travel and the liveability of cities, and how this can inform policy and planning.

3. Why have I been invited to participate?
We are involving cyclists who regularly cycle as part of the way they move around their city and suburbs. Cyclists are being invited to participate by posters displayed at UTAS or through the newsletters of cycling organisations. You might have been invited because of your involvement in these organisations or because you cycle regularly to get around your city and suburbs. Your involvement and subsequent insights will provide valuable data for the study. Participation is entirely voluntary and there are no consequences if you decide not to participate.

4. What will I be asked to do?
The study uses small, portable digital cameras to record a participant's trips with either the researcher filming using a 'follow-along' technique to follow and record from the researcher's bike or the participant filming their own trip from their bike (see below for details). Either way, the digital record of your ride will then be used in an interview as the basis for exploring and record your insights into how you 'do' your practice of cycling. The emphasis of the research design is to capture everyday journeys as they routinely happen without the research work distracting participants and changing what would normally be taking place.

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'Follow-along'

If you wish to take part in the 'follow-along' method, a time and place will be arranged that suits you for us to follow and record you from a distance as you conduct your routine trip as usual. It may involve more than one trip and again it will be undertaken in a manner that best suits you.

Self-recording

If you wish to record your trips yourself the researcher will arrange a suitable time to show you how to set-up and operate the camera (the cameras are very compact, lightweight and discreet, as well as being robust, weatherproof and simple to operate). The camera will be supplied with a range of mountings for fixing it to the bike or helmet. A cable will also be supplied for downloading and viewing on a computer. You can record your immediate impressions using a 'journal' format if you wish or simply wait for the interview to have your insights recorded.

If at any stage the camera becomes a distraction, please discontinue videoing straight away and let the researcher know as soon as you can. Any feedback that highlights issues and improvements is most welcome at any time.

The semi-structured interview

The interviews use 'semi-structured' techniques as the means to gain your insights. Interviews are audio-recorded for transcription later. You can review and correct the transcript if you want. The interviews will be up to 60 minutes in duration depending on the amount of 'footage' viewed. It is important to note that publication of this research will include some direct quotes from participants. Your confidentiality will be respected here and your identity will not be disclosed. Interviews will be conducted in a meeting room on campus at UTAS Newnham or Sandy Bay, or any other place arranged as most convenient to you.

5. Are there any possible benefits from participation in this study?
Trialing the video-camera has shown that recording and viewing regular trips can be interesting, informative and enjoyable. The recordings give participants the opportunity to review the many things that happen as part of their regular trips that are usually quickly forgotten – it can be a source of feedback on how you ride.

There are potentially wider benefits to the community too as studies of this nature are unusual and the insights and understandings generated are valuable. How cyclists actually negotiate roads, traffic and infrastructure including bike infrastructure is important for informing transport policy and planning.

6. Are there any possible risks from participation in this study?
The study is designed to capture video-footage of cycling trips as they routinely happen without influencing the ride risk profile. To mitigate and manage any risks that may be inadvertently introduced a number of measures are designed into the research:

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- If you want to be filmed with the 'follow-along' method, the researcher (an experienced cyclist) will have the camera mounted on his bike and will follow along in a safe, unobtrusive manner.
- If you wish to film your own rides the small, lightweight camera is purpose designed to be wearable and mountable without interfering with the 'action'.
- There should be no distraction or discomfort caused by your participation but if any distraction or discomfort is encountered you must pull over safely, stop the videoing and contact the researcher as soon as possible.

7. What if I change my mind during or after the study?
Participation is voluntary and participants are free to withdraw at any time without providing an explanation. If you choose to withdraw your data can be deleted if you wish. We appreciate your input and if you have questions or concerns at any stage please do not hesitate to raise them.

8. What will happen to the information when this study is over?
All of the research data will be kept in a locked cabinet in the office of Dr Williams or on secure computer storage-drives at UTAS. While most of the data will be deleted or destroyed five years after publication of the information some will be archived as part of the thesis. If you agree, we will continue to archive the information generated with you (securely as described above). This option is provided to you in the Informed Consent form.

9. How will the results of the study be published?
The PhD thesis that this research forms part of is due to be completed by October 2015. There may also be papers arising out of this study for publication in research journals. Please feel free to contact us for a copy of the final report or publications.

What if I have questions about this study?

You are most welcome to contact us at UTAS should you have any comments or questions about the research:

Mr Roger Vreugdenhil

Phone: (03) 6324 3778 Email: Roger.Vreugdenhil @utas.edu.au

Dr Stewart Williams

Phone: (03) 6226 1866 Email: Stewart.Williams@utas.edu.au

Dr Aidan Davison

Phone: (03) 6226 7590 Email: Aidan.Davison@utas.edu.au

UTAS

This study has been approved by the Tasmanian Social Sciences Human Research Ethics Committee. If you have concerns or complaints about the conduct of this study, please contact the Executive Officer of the HREC (Tasmania) Network on (03) 6226 7479 or email human.ethics@utas.edu.au. The Executive Officer is the person nominated to receive complaints from research participants. Please quote ethics reference number H13428.

Final words

Thanks again for your interest and participation in this research project.

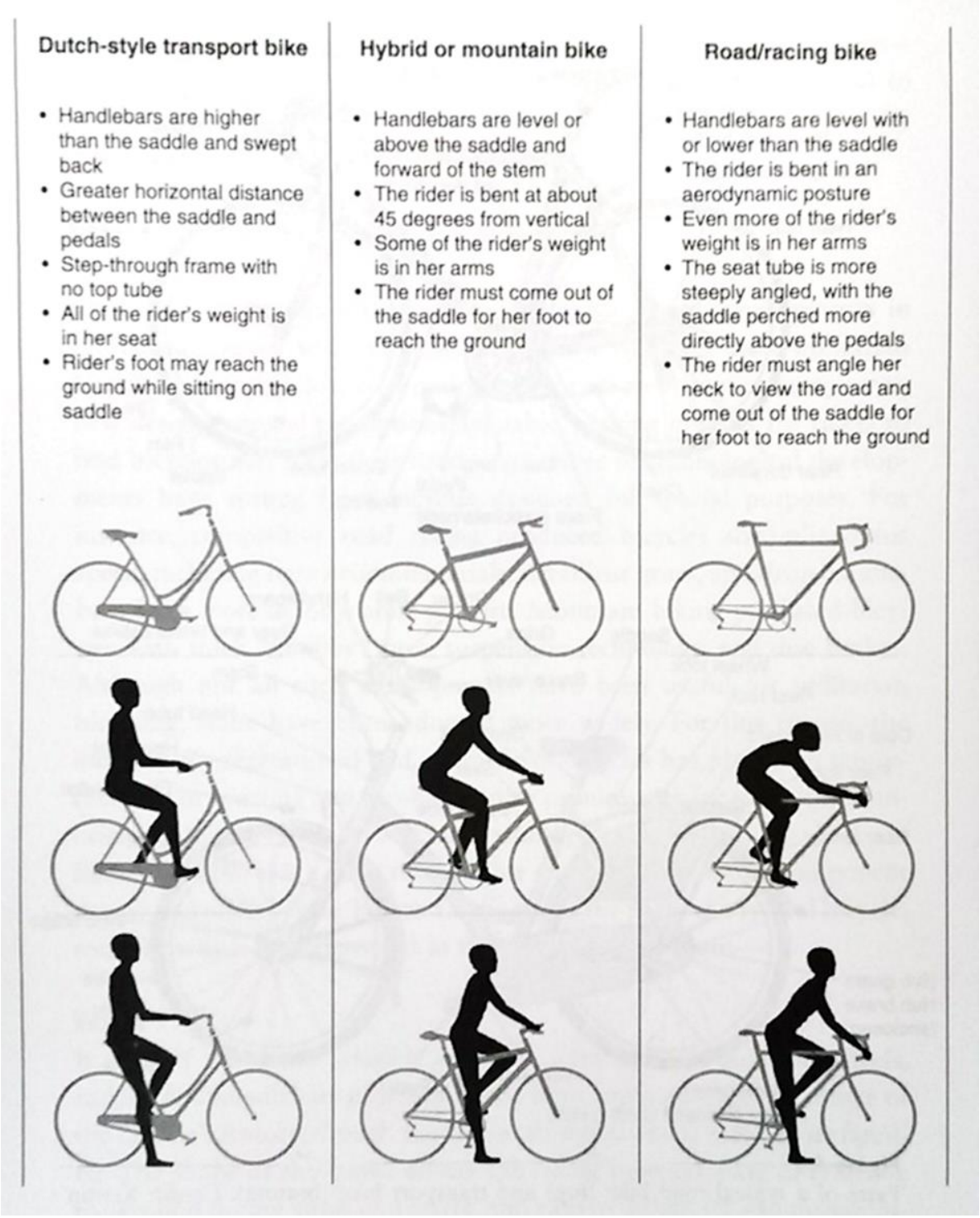
(This information sheet is for you to keep)

Dr Stewart Williams

Dr Aidan Davison

Roger Vreugdenhil

Appendix E: Bicycle types



Source: Lovejoy and Handy (2012, 88)

Appendix F: Flyer

Researching the everyday practices of cycling

Do you cycle regularly to your place of work, of higher education or to the shops?

Are you interested in being part of new research into the everyday practices of cycling?

We are looking for volunteers to take part in a doctoral research study being conducted through the University of Tasmania in the School of Geography and Environmental Studies investigating the everyday practices of cycling. Digital video cameras are used to film rides to examine how bike and rider combine to negotiate roads, infrastructure and traffic during regular cycling trips to work, the shops or the city. The footage is then reviewed and discussed together with you by the researcher.

If you are interested and would like to find out more please contact Roger Vreugdenhil at roger.vreugdenhil@utas.edu.au